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Flying One's Kite

It is by no means unusual for an alloy to be developed, to be given trade marks by a number of firms, and finally to settle down as a British Standard Specification. This conclusion to the cycle is not too happy, as the staff of a works is more interested in maintaining and enhancing a product carrying its own trade mark than the mere turning out of goods to a specification which, by its very nature, the general run of manufacturers can easily meet. This is emphasized when we recall advertisements stressing that "X and Company's" average tests run so many tons per square inch above the value required by the standard specification. Such an unsporting action may, however, spur an industry to revise the specification.

In recent times, the British Standards Institution has taken the wise step of issuing a certification-mark scheme carrying the well-known "Kite Mark" for goods—subject to inspection—which meet a standard specification. The major factor is that the trade has available an overall quality mark of real value, substantially equal to a private trade mark. This results in arousing the interest of the staff of the plants making the material The first application by a trade association within the foundry industry to use the "Kite Mark" is that devoted to the making of zinc-alloy die-castings, the details of which are printed elsewhere in this issue. It will be noted that the "Kite Mark" is based on compliance with B.S. Specification Number 1004. As is the usual practice, this specification sets out the acceptance conditions, to include freedom from defects; provision of weight tests (as these are indicative, when low, of unsoundness); the exclusion of repairing by patching, plugging, and welding, except by permission; and, when required, the submission to a steam test. However, the crucial factor in this case is that certification is based on the strict conformance with the chemical composition of the alloy, that is to say, the keeping of impurities to the minimum specified. The other requirements, obviously, must be adhered to, as, for instance, dimensional accuracy. In other cases some cardinal property other than chemical composition could be chosen.

The question arises whether or not other sections of the foundry industry could with advantage examine the possibility of taking similar steps. The reputation of the British Standards Institution stands very high in the opinion of overseas users of engineering components, and to identify one's products more closely with its published specifications is bound to enhance their reputation. Moreover, this does not debar a manufacturer from associating his own trade mark with the "Kite" certification. In fact, there are amongst the hundreds of types of castings manufactured by the industry quite a number for which this criterion of quality is already in use. Within our industry there exist a few cases of group trade-marking which have proved to be eminently successful, and provide a pointer as to what can be usefully accomplished by instituting such methods. The foundry industry will follow with interest the benefits which the members of the Zinc Alloy Die-Casters' Association will derive from this new activity. At the very least the Z.A.D.C.A. are to be congratulated on their enterprise.

H

Correspondence

STRUCTURE OF GRAPHITE SPHERULITES

To the Editor of the FOUNDRY TRADE JOURNAL

Writing from Eisenwerk Gelsenkirchen, Germany, DR. A. WITTMOSER states:—

SIR,—I have read with great interest of the work of M. N. Parthasarathi and B. R. Nijhawan (JOURNAL, December 31, 1953, p. 809). These researches confirm the results found during work conducted in the research department at the Gelsenkirchen ironworks which was reported to the International Foundry Congress in September, 1953, in Paris, and reproduced in full in the Technical and Trade Supplement of *Giesserei*, October, 1953, vol. 12, pp. 571-585.

In one connection, however, I do not think that the evaluation of the different micro-structures quite agrees. According to the writers' observations, the "centre" (kern) only appears in the centre of the graphite nodule when the upper part of the nodule has been cut away by sectioning through the centre point of the nodule. This is also quite clear from the series of polished sections which have been shown by the Indian authors. However, it may occasionally occur that a core-like structure appears in the lower levels of the nodule when the section has not been polished quite sufficiently. With proper grinding and polishing, this is never the case; one always finds the well-marked spherulitic relief-structure appearing again.

To make this a little clearer, Figs. 1 to 3 may be considered. Figs. 1 and 2 show the same microsection after different degrees of grinding and polishing. In Fig. 1 the nodules numbered 1, 3 and 7 appear to contain well-marked nuclei, but in Fig. 2 these same nodules are clearly of a spherulitic structure. On the other hand, the newly - exposed nodule (No. 4), in which the sectioning has passed through the centre point, carries a core in both Fig. 1 and Fig. 2. The way in which graphite nodules appear when subjected to different degrees of polishing at different levels has been illustrated diagrammatically in Fig. 3.

I am convinced that if Mr. Parthasarathi and Mr. Nijhawan will follow up this work with further tests they will find a similar result.

February 3, 1954.

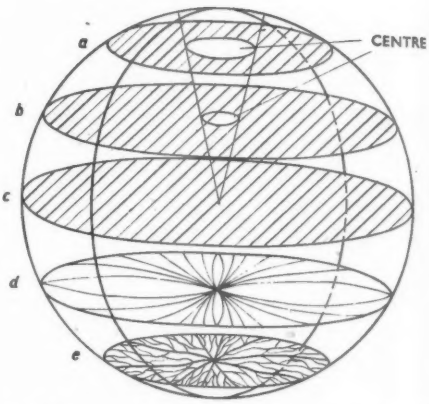
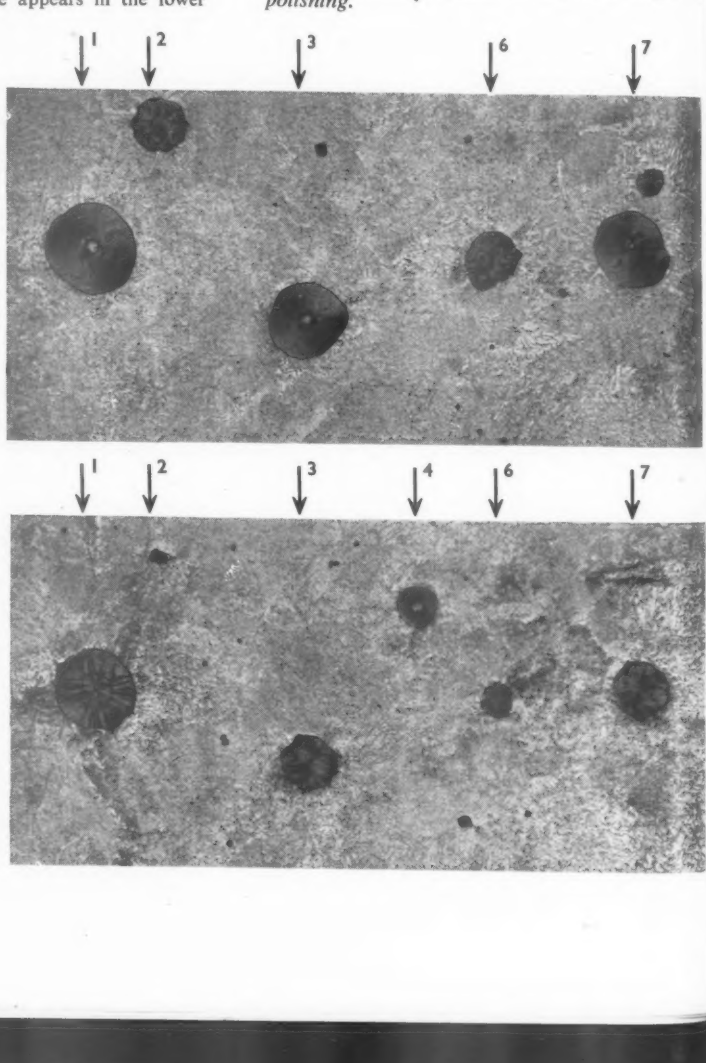


FIG. 3.—*Diagram illustrating the way in which graphite nodules appear at different stages of polishing.*



FIGS. 1 AND 2.—*Same microsection after different degrees of grinding and polishing.*

Approach to Foundry Mechanical Handling*

By C. M. G. Wallwork

Mechanical handling in the foundry is primarily directed at cost reduction and should be tackled logically and methodically. By the use of work-study methods it is possible to achieve many savings with little or no capital expenditure. Where capital expenditure is required, the methods outlined in the Paper, by bringing to light the percentage return on capital spent, form a guide to the sequence in which mechanization should be tackled.

When approached to give a Paper, the Author thought first of describing the various sorts of equipment available for handling the many materials used and criticizing these, but this struck him as unsatisfactory because it has been done before and, moreover, as the lecture was for foundrymen, then if they did not already know what equipment was available to them, it was time they did.

A second idea was to describe the equipment personally used with *pros and cons*, but, again, equipment that happened to suit a particular set of circumstances in one foundry might be quite unsuitable in another context and, moreover, he had already decided that equipment thought to be most suitable a few years ago was now obsolescent. Finally, it was becoming obvious that if all the published ideas had been applied in all foundries, the industry would be producing much more cheaply than at present, and the reason that new ideas were not applied was really one of management attitude and the difficulty of deciding how to tackle the job in a logical way and at minimum cost rather than actual lack of finance. This question of how to set about tackling the job the Author had originally found to be a very real problem. So it was finally decided to describe the way he had set about choosing what to mechanize in his own foundry, and how he selected what he considered to be the best means then available.

Background

It seems to be the fashion these days for lecturers to give something of their own background before commencing their dissertation and this is no bad thing, as it assists the audience in forming a judgment on the remarks made. The Author entered the foundry industry with his present company in the latter half of 1946, after serving six years in the Engineering Branch of the Royal Air Force, which was preceded by an engineering apprenticeship of five years in a small shipbuilding yard with the usual night school technical training. During this seven years with Henry Wallwork & Company, Limited, where he served as foundry engineer, production manager, and in his present position, he had reorganized one mechanical moulding plant, applied mechanized methods to two other moulding departments, mechanized the core shop and rationalized handling in the fettling department. These alterations have been carried out relatively cheaply, and concurrently systems of work study, production control and standard costing were introduced; these and other factors have resulted in considerable increases, in output and productivity, with very little more staff and slightly less floor area. So that it can be honestly stated that in these particular circumstances at least, the methods about to be described have proved themselves. They certainly have resulted in a healthy morale throughout the establishment and, just as important, a healthy balance sheet.

No claim is made that this approach is in any way original, and no doubt hundreds of others have developed similar and better methods, nor can it be said that he has developed this attack on the problems of handling as far as possible—the staff was learning all the time and had made plenty of mistakes which have thrown up the need for improving the method of approach further, but at least what has been done has the semblance of being systematic.

Scope

The Paper has therefore been called "An Approach to Foundry Mechanical Handling," since it is the approach which has been developed over a number of years that it is felt to be fundamental in obtaining the desired results at the lowest cost. This type of approach, as applied to all foundry operations, was recently the subject of a three-day conference on "Foundry Simplification" at Ashorne Hill and no apology is made for reiterating some of the salient points made there during the course of this Paper, since it is the attitude of management towards mechanical handling in any particular foundry that will result in improved efficiency and in this respect the attitude of the higher management comes first and by a long way foremost. The only alternative to management leadership is drift, and in these days of hard competition, the rocks are close on either side of our course.

MANAGEMENT TOOLS

Drawing or Blueprint Stage

To carry the nautical metaphor a little further—the only way to keep the engines and steering gear

*Paper read before the Birmingham branch of the Institute of British Foundrymen.

TABLE I.—*Foundry Costing Spread Sheet.*

Department or " budget centre "			Moulding.		Coremaking.		Fettling.		Melting.	
Section or " cost centre "			1	2	3	4	5	6	7	8
Output in standard hours										
Output in tons										
Number of employees: direct										
" " indirect										
" " supervisory										
Floor area										
Item.	Annual cost.	Spread basis.								
Labour direct		actual								
Labour indirect		actual								
Labour total		actual								
General Overheads.										
Furnace coke		tons							•	•
Heating coke		area	•	•	•	•	•	•	•	•
Limestone		tons							•	•
Ganister, firebricks, etc.		actual							•	•
Melting loss		tons							•	•
Foundry stores		st. hrs.	•	•						
Fettling stores		st. hrs.					•	•		
Core-shop stores		st. hrs.			•	•				
Sand		tons	•	•	•	•				
Clay, coal-dust, etc.		tons	•	•						
Core-sand binders		tons			•	•				
Cleaning shot and stores		tons					•	•		
Electricity		actual	•	•	•	•	•	•	•	•
Gas		actual	•	•	•	•			•	•
Laboratory		spec.	•	•	•	•			•	•
Pattern repairs		st. hrs.	•	•	•	•				
Maintenance		actual	•	•	•	•	•	•	•	•
Internal transport		spec.	•	•	•	•	•	•	•	•
Welfare		emp.	•	•	•	•	•	•	•	•
Depreciation		val.	•	•	•	•	•	•	•	•
Salaries		actual	•	•	•	•	•	•	•	•
National insurance		emp.	•	•	•	•	•	•	•	•
Rent and rates		area	•	•	•	•	•	•	•	•
Holiday credit expense		emp.	•	•	•	•	•	•	•	•
Statutory holiday expense		emp.	•	•	•	•	•	•	•	•
Insurances			•	•	•	•	•	•	•	•
Totals										
Cost per standard hour										
" " ton of saleable castings										
Direct labour per ton saleable										
Indirect labour per ton saleable										
Total labour per ton saleable										

Administration and selling costs charged as a percentage of total cost. Metal charged at standard price per lb. according to specification.

in good order and to avoid this drift is to have at hand for constant use a first-rate kit of tools. Similarly, in running a foundry there must be a good kit of management tools if the management is really going to get on with the job and keep its affairs under control, so now let the toolbox be opened and the contents examined.

The first thing to be noticed as the lid is opened is a well-thumbed blueprint on top and the tools beneath well handled, well worn and polished from constant use, not just bundled up and brought out for display as the occasion demands, from the back rack in the stores.

Point No. 1

Let it be here emphasized—there are good and proved management tools available to everybody, if they be but possessed and used, which availability is not invariably known and when they are they are often tried rather half-heartedly and then left to rust soon after the day they were acquired.

Just read the blueprint, which forms our working instructions or policy, and get from it what is to be tried and accomplished.

Instruction No. 1: The first responsibility is to supply the customers with castings of the quality they require, when they want them, at a competitive price.

Instruction No. 2: The foundry must give all its employees security of employment, a just and fair wage, the opportunity for advancement and good working conditions.

Instruction No. 3: The company must give its shareholders a fair return on their money and maintain and improve the value of the equipment which represents this money. A foundry will be able to fulfil all three of these duties best if it produces efficiently and at the lowest possible cost. Thus any mechanical appliance to be considered must, in turn, fulfil these three conditions: (1) Reduce overall cost; (2) improve working conditions; and (3) maintain and improve quality.

Point No. 2

Thus acceptance or rejection standards for any alteration to be made in methods of handling or in any foundry operation carried out have been established.

Here it should be made clear that the basis of the approach to the problem of reducing costs by improved handling, is that every foundry operation is amenable to mechanical aids of one sort or another and there is an element of handling in

stick against which to measure present cost perform- every operation carried out. What had to be decided was "Is it a paying proposition?" and until the facts have been collected and analysed it was really unknown.

Costing

Now bearing these three conditions in mind, which are (1) reduce overall cost; (2) improve working conditions; and (3) maintain and improve quality, one can now temporarily put aside the blueprint and pick up the first tool labelled "Costing," and since the first criterion by which to judge any piece of handling equipment deemed suitable for installing is "Will it reduce the overall cost of the castings?" the management will be quite unable to assess the comparative value of different schemes and whether they show an improvement over existing methods, unless the cost can be ascertained immediately and the cost of the proposed method can be estimated reasonably accurately, or those of a number of alternative methods.

More important still, until the cost of all the many and various operations carried out in the foundry is known reasonably accurately, one is quite unable to pinpoint the operation which is going to yield the greatest return for any capital spent on equipment and use this as a starting point for a programme of cost reduction.

Applying the military principle of "mass," which means concentration of the maximum effort at the most vulnerable point, or translated into terms of one's own problem, there is only a limited amount of money to spend at any one time and this must, in principle, be concentrated at the point where it is going to have the greatest effect on cost reduction. This in turn has a snowball effect in so far that further capital for reinvestment is accumulated as rapidly as possible.

Ideally it would be nice to have a system of standard costing, covering all operations, but this presupposes the establishment of standard operating conditions and preferably measured output standards, these take some time to develop, and if a foundry is not fortunate enough to have them already established then something simpler but somewhat less accurate must be substituted. Table I indicates a simple means of ascertaining approximate costs which will be near enough for the early stages of investigation, and is believed to be what accountants call a "spread sheet." It may be thought that this appears to be an unnecessary elaboration, that when a machine is applied to take the place of human effort all one needs to do is to equate the running cost of the machine to the labour cost it is replacing. The author does not hold this view, although it may be true for the very simplest applications, generally speaking whenever mechanical power is substituted for human effort one is forced to alter the distribution of the overhead charges and as these overheads have still to be recovered in the price of castings sold, it is distinctly preferable to have a simple device like this so that the whole cost picture can be kept constantly under review, and so that an accumulation of small and apparently insignificant changes cannot drastically alter the cost spread without it becoming obvious.

As shown by Table I, what is done on the spread sheet is to list the operations carried out along the top of the sheet and all the expenses incurred down the left-hand side and use various bases, such as floor area, number of operators, tonnage, etc., on which to spread these costs. Some of these bases are perhaps a little arbitrary, but so long as one is satisfied that they are the best to be found and adhere to them, at least it is known that one is comparing like with like in any alteration proposed. The important thing is to be able to arrive at a ratio of cost to output for each operation, whether the output be measured in standard hours of work, tons of castings, or other factor, and thereby provide a yard-

TABLE II.—*Process Flow Chart for Main Materials.*

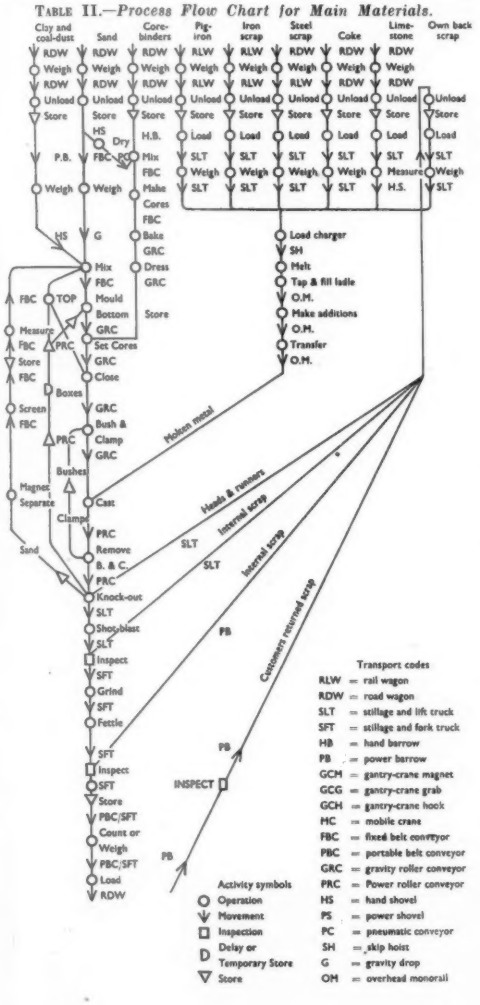


TABLE III.—*Material Movement Analysis.*

Department:—*Melting.* Section:—*Nos. 2 and 4 cupolas.*
Budget centre :—6 Cost centre:—16
Description of operations:—*Pig-iron from supplier to cupola.*
Present cost centre activity:— Tons per period..... Std. hrs. per period..... Per cent. budget.....
Maximum present one shift capacity :— Tons per period..... Std. hrs. per period.....

Symbol	Operation.	Batch size.	Frequency.	Wt. per period	Method of movement.	Man/hours.		Total cost	
						Batch.	Period.	Tons.	Period.
⊕	Supplier loads railway wagon				Crane and magnet ..				
↓	Railway moves to local siding				Railway loco				
▽	Store in rail wagon at local siding ..				—				
⊕	Contractor unloads to road wagon ..				Manual				
↓	Contractor moves to foundry				Road wagon				
○	Weigh road wagon at entry to foundry				—				
↓	Contractor moves to foundry stockyard				Road wagon				
⊕	Unload wagon into foundry stockyard				Manual				
▽	Store in foundry stockyard				—				
⊕	Load into internal transport				Manual				
↓	Move to cupola platform				Lift truck and stillage..				
⊕	Unload on to platform				Manual				
▽	Store on platform				—				
⊕	Load into barrow				Manual				
↓	Move to weigh scales				Hand-barrow				
○	Weigh charge				—				
↓	Move to charging door				Hand-barrow				
⊕	Charge cupola				Manual				

ance and to help to estimate the cost of any proposed scheme.

To illustrate this point as to the necessity for keeping the overall cost figure in mind, one might profitably take the instance of a moulding department with a considerable proportion of manual handling which it is proposed to mechanize. Thus one is likely to achieve a desired output of castings in considerably less space with fewer operators, and the cost of the spare space, *i.e.* all items chargeable to floor area, must now be spread as a general overhead on all departments until it is utilized once more. Similarly a general spread is needed for the cost carried by the displaced manual labour. Although the effect of one instance like this in itself may not be very great, the cumulative effect of a number of proposed changes of this sort must be borne in mind.

Work Study

The second "tool" is a composite one, rather like a set of spanners and may be called Work Study, and by means of this information is collected and recorded. This is analysed, improvements synthesized and these are measured against existing set-up with "Tool No. 1 costing."

Observation.—The first "spanner" within this set may be called Observation. One must study and record information about the movements of every material used and about every operation carried out and this information must be accurate. It is useless sitting in the office with a plan of the works and trying to estimate it all—failure will result. One must take actual figures of tonnages for all materials, measure the actual distances they are moved and get the real man-hours, and wage cost, not only numbers of labour involved. Incidently, during this

stage management will learn much about its foundry that it did not know before, it will be found that all sorts of things are being done which it knew occurred in other firms but were quite certain never happened domestically. The important point to remember is that the job must be tackled in a logical and methodical manner and that copious notes should be taken of any obvious inefficiencies and means of overcoming these as progress is made. This will save memory from becoming overloaded and reduce the amount of time needed to be spent retracting steps.

Analysis.—The next "spanner" may be called Analysis and to aid in this a plan of the foundry and a process flow chart are necessary, the former is usually already available, no doubt, but assurance must be had that it is up to date, and the second can be prepared as a result of observations. One of the Members of the Institute, Mr. Geiger, recently gave an excellent paper on this subject at Ashorne Hill and its study is strongly recommended in order to become familiar with this subject. In principle, as is shown by Table II, it consists of a visual record of everything that happens in a process or operation indicated by a simple code, and by transferring observations and study work to the Flow Chart and to the foundry plan step by step, and by cross reference by means of code numbers, one will gradually build up a complete graphic picture of all the operations carried out in the foundry. We can then add to the Flow Chart details of the tonnages handled, frequencies, batch sizes, method of movement, labour involved and present cost. This additional information can be shown on a form similar to that on Table III.

TABLE IV.—*Handling-equipment costs. (Under present conditions these figures can fluctuate from one manufacturer to another and should only be used as a rough guide.)*

Description of item.	Size or Duty.	Approximate cost installed.	
		Fixed cost.	Cost per foot.
		£	£ s. d.
Belt conveyors	18 in. wide ..	220	8 10 0
,, ...	24 in. ,, ..	250	10 5 0
,, ...	30 in. ,, ...	300	12 0 0
Gravity roller conveyor (medium-duty)	18 in. wide, 3 in. dia., 4 in. pitch	—	2 5 0
Gravity roller conveyor (medium-duty)	20 in. wide, 3 in. dia., 4 in. pitch	—	2 10 0
Gravity roller conveyor (medium-duty)	24 in. wide, 3 in. dia., 4 in pitch	—	2 15 0
Gravity roller conveyor (heavy-duty)	18 in. wide, 3½ in. dia., Staggered double ww.	—	5 10 0
Overhead chain conveyor	120 lb. per carrier ..	220	5 10 0
Pallet mould conveyor	350 lb. per pallet ..	550	18 10 0
Steel-band conveyor ..	24 in. wide	280	15 0 0
Slat conveyor	Medium-duty ..	—	10 0 0
Vibrating tray conveyor	,, ...	—	12 0 0 per foot run of gantry.
Gantry cranes	5 tons 50 ft. span ..	3,300	3 0 0
	5 ,, 70 ft. ,, ..	4,200	3 0 0
	10 ,, 50 ft. ,, ..	4,000	3 10 0
	15 ,, 50 ft. ,, ..	4,400	4 0 0
Platform-lift trucks ..	1 ton	260	—
,, ..	2 ,, ...	320	—
Fork-lift trucks ..	½ ,, ...	900	—
,, ..	1 ,, ...	1,200	—
,, ..	2 ,, ...	1,500	—
Steel-box stillage ..	5 by 4 by 1 ft. on legs	15	—
Flat platform stillage ..	5 by 4 ft. on legs ..	5	—

Consultation.—Having completed the record of what is happening now and before the first point can be picked out for application of improvements, the management must carefully study the overall position from a long term point of view. It is necessary to consult the company policy to ensure that there are no major changes anticipated in the range of products being made, and so that provision can be made in the plans for any special developments which are envisaged. At this stage the sales side must also be consulted to ascertain if there is any particular section of the output capable of having a potential expansion if subjected to a cost reduction. By now there should be an accurate picture of what is happening at the moment and a fair idea of possible future developments. These facts will enable the outlining of long-term plans for reducing the cost of handling throughout the foundry. Although this provisional long-term plan may be a long way from achievement at the moment, it is vital that it be evolved at this stage and always be kept in mind when considering detail improvements. No doubt many people are blessed with foundries that have "growed like Topsy" with a bit added here and there from time to time as circumstances dictated. If management is to produce at lowest cost it must try to avoid emulating Topsy and ensure that every alteration made is a step towards the long-term plan and not just another improvisation to overcome the problem of the moment. The guiding principles here should be to provide a steady and smooth flow from one operation to another, without back tracking and with adequate space for storage as required, of inter-process stocks and space for means of handling these mechanically.

Having produced a long-term layout, this should be submitted for discussion and criticism at all levels and approval in principle received before any time is spent on detail method improvement. It is only too easy to waste hours of work on detail improvement which are set at nought by lack of a vital piece of information on company policy, sales or future development.

Formulation of plans; synthesis.—A start may now be made by picking out possible points of application for replacement of manual handling by mechanical means. As it is likely that working to a limited financial budget for expenditure on improved handling each year will have to be met it is as well to have a rough and ready guide for initial appraisal of the economies of this substitution. From experience the Author starts off with a number of rough assumptions—first, that he will expect a ten-year life from a piece of equipment, and that at the end of this period the item is likely to be obsolete or obsolescent and so due for replacement by a more efficient piece of equipment—this does not mean that there will be no equipment older than 10 years in the foundry—far from it—but it has been found that at or about that age equipment needs pretty extensive overhaul and rebuilding and probably a fair amount of modification to

TABLE V.—*Improved Handling Analysis.*

Department :—*Melting.* Scheme No. :—
Budget centre :—6 Section :—*Nos. 3 and 4 cupolas.*
Cost centre :—16

Description of activity :—*Pig-iron from supplier to cupola.*

Present method.				Proposed method.						
Symbol.	Operation or movement.	Total ton.	Cost period.	Symbol.	Operation.	Method of movement.	Capital cost.	Total ton.	Cost period.	Percentage on Capital.
(D)	Road/rail wagon			(D)	Supplier loads rail wagon	Crane and magnet				
↓	Move on railway			↓	Railway to foundry siding	Railway locomotive				
▽	Rail wagon, in siding			D	Temporary store in siding	—				
(D)	Unload to road wagon			(D)	Unload and weigh	Crane and magnet				
↓	To foundry			▽	Store in stockyard	—				
○	Weigh			(D)	Weigh and load bucket	Crane and magnet				
↓	To stockyard			(D)	Transfer charge bucket to cupola	Overhead telpher and bucket				
(D)	Unload into stockyard									
▽	In stockyard									
(D)	Load internal transport									
↓	To cupola									
(D)	Unload at cupola platform									
▽	On platform									
(D)	Load into hand-barrow									
↓	To scales									
○	Weigh charge									
↓	To cupola-charging door									
(D)	Charge cupola									
	Totals					Totals				

Present cost per ton .. .. ..
At present volume of.....tons per period.
At maximum capacity (present) of.....tons per period.

Proposed cost per ton .. .. ..
At present volume of.....tons per period
At maximum capacity (proposed) of.....tons per period.

bring it up to the latest practice. Secondly, it is assumed that the maintenance and repair bill, plus power consumption, will, over ten years, be equivalent to the initial price. Finally, it can be assumed that the cost of paying and caring for a foundry labourer is £500 per annum.

Thus, combining the first and second assumptions there is to recover one-fifth of the cost of the equipment each year, and combining this with the third assumption that the yearly cost of a labourer is £500, a figure of £2,500 is reached as a rough break-even figure of the sum of money that one can afford to spend to release one labourer from manual handling operations.

Let it be emphasized at this point that these figures are only a very rough and ready guide to enable one to pick out the initial points of application without having to work every handling problem out in detail initially. Yet it is near enough to put into relief the points at which obvious savings can be made.

Next, there must be prepared a table of approximate costs of various types of handling equipment as shown in Table IV, so that, for example, it becomes known that if consideration is being given to applying a conveyor X feet long, an approximate installed cost per foot can be established, and thus obtain a rough capital cost. This information can

readily be obtained from the manufacturers of the equipment, and by tabulating any quotations received the table can be gradually built up and kept up-to-date.

This establishes a position where the provisional chart for handling improvement can be prepared, as shown in Table V. This details all the operations at present carried out, together with their present cost, estimated capital cost to mechanize, annual or periodic charge against this plant, saving or loss and percentage return on capital. Obviously to prepare this information, even in its present approximate form, requires more than a cursory examination of the problem, and each section and operation in turn must be examined, first with a view to seeing whether it is possible to eliminate any of the operations, movements or handlings. It must never be forgotten that the best way to reduce handling costs is not to handle at all.

A profitable start may be made by examining at the handling of the metal from the supplier to the point at which it enters the cupola, and here it may be assumed that most of this is being done manually under the present set-up with a considerable number of re-handling operations carried out. Ideally one should bring the railway wagon to a point where the metal can be lifted direct from the wagon, weighed during the lift, and deposited straight into the cupola. This is obviously not practical from a number of aspects, but nevertheless this is the sort of mental approach that must be made to the problem and the next step is to introduce one intermediate storage operation.

The proposition then becomes practical, and one can estimate for the storage area, crane coverage and weighing and charging equipment. Here use is made of Table IV to give a rough capital cost and return on investment. This analysis is then repeated for all other operations throughout the foundry and all the information shown in Table V completed. It should here be emphasized that it may be, and almost certainly will be, necessary to take out a considerable number of alternatives for the information recorded in Table V, but the first chart should always show the best possible results achievable, more or less regardless of the amount of capital required, since *force majeure* one is working to a limited budget for expenditure on mechanical handling plant it may well be that though some information will be given about improved handling methods, that show such an attractive return on the capital invested that the Board will authorise additional expenditure, or even consider raising additional capital to accomplish the task. Even if this does not occur there is valuable information as a guide when the time arrives to reconsider the long- term plans. It is at this stage that a rough programme for mechanization over a number of years on the present budget can be mapped out with alternative programme for increased or reduced budgets. Each of these should be complete in itself and should show the estimated amount of savings and return on the investment for submission to the Board. At this stage also one should reconsider the long-term plan and arrange to have this criticized at all levels in the light of the information derived through working up the proposed programmes.

It should now be possible for the Board to consider and approve in principle the long-term plan and to authorize the investigation in detail of the projects for the first year and to establish a budget for this.

(To be continued)

French Foundry Congress

The *Association Technique de Fonderie* announces that the next congress will be held at Lyons on Wednesday and Thursday, June 2 and 3. The opening session will take place at 8.30 a.m. in the offices of the *Union Régionale des Fondeurs du Sud-Est* at Villeurbanne. During the morning a visit will be paid to the district laboratories of the *Centre Technique*. At 2.30 p.m. there is to be a joint session with the three other metallurgical and engineering organizations, whilst at 7.30 for 8 p.m. the annual banquet is to be held. On Thursday, a third technical session will be held at the same place as the day before. From 2 to 4 p.m. on that day there are to be works visits.

Safety Conference. The Association of Bronze and Brass Founders have informed members that there are a few vacancies for the conference on " Safety in Ironfoundries " organized by the C.F.A., to be held at Ashorne Hill on Monday, Tuesday, and Wednesday of next week (March 1, 2 and 3), to which they are invited. A.B.B.F. members who may wish to attend are requested to telephone the secretary, Council of Ironfoundry Associations, London, immediately (WHItehall 7941). The conference programme, much of which is equally applicable to non-ferrous founders, was printed in the JOURNAL, February 11, 1954.

Furniture Exhibition

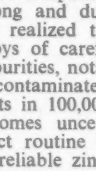
This year's British Furniture Exhibition at Earl's Court, which closes to-day, is wholly devoted to domestic lines. One of the interesting aspects is the increasing use of die-casting in the manufacture of small fittings, such as locks, bolts, hinges and curtain-rod attachments. Most of these are made of brass. Die-cast fittings of this type, when ordered in quantity, are stated to be considerably cheaper than those made by stamping, etc. A new backstand sander shown should be of interest to patternmakers. It is made by Rye Machinery Sales (High Wycombe), Limited, and has been designed for faster cutting, longer life and it is claimed that the belt will keep cool at high speeds.

I.B.F., London branch " Men-Only."—Applications are now invited for tickets for the annual " stag party " of the London branch of the Institute of British Foundrymen. This will be held at the Horse-Shoe Hotel, Tottenham Court Road, London, W.C.2, on Friday, March 19, at 7 for 7.30 p.m. The programme includes dinner and light entertainment. Priority in the allocation of tickets (22s. 6d. each) is to be granted to members of the Institute until March 5, when guest tickets will be issued according to date of application. Requests and remittances for places should be sent to the assistant honorary secretary of the branch, Mr. A. R. Parkes, c/o FOUNDRY TRADE JOURNAL, 49, Wellington Street, London, W.C.2. Accommodation is limited, so early application is desirable.

Zinc-alloy Die-castings Certification Scheme

The British Standards Institution and the Zinc Alloy Die-Casters' Association have together drawn up a certification-mark scheme for zinc-alloy die-castings to commence on March 1. This means that customers can order castings guaranteed to be made under strictly controlled conditions subject to inspection by the B.S.I., and complying with the exacting requirements of British Standard 1004. This standard was published in 1942 to safeguard the quality of critical ammunition components being made from zinc-alloy die-castings.

Die-casting in zinc alloys is a quantity-production process chosen by many designers for parts, often quite complicated in design, which are required to be strong and durable. To ensure that these qualities are realized to the full, it is essential to use only alloys of carefully-controlled composition. If certain impurities, notably lead, tin, and cadmium, are allowed to contaminate the alloy—even to the extent of a few parts in 100,000—the future behaviour of the castings becomes uncertain. Already, in many foundries a strict routine is followed so that each year millions of reliable zinc-alloy die-castings are made for use in motor cars, electrical equipment, household fittings, light and heavy engineering components, etc. Some customers of the founders are still unaware of the dangers they run by being "penny-wise" about zinc-alloy die-castings, and some firms are still prepared to supply off-grade castings cheaply to the ignorant or indifferent buyer.



The B.S.I. "Kite" Certification Mark.

Guarantee for Customers

The purpose of the certification-mark scheme is to give the customer a guarantee that if he orders die-castings from a firm licensed under the scheme, he will receive reliable castings complying with British Standard 1004. Wherever possible, the castings will carry the Kite Mark (Fig. 1) "B.S. 1004," and the die-caster's name, trademark, or B.S.I. licence number. Castings too small to be marked individually will be supplied in boxes specially labelled. The new certification-mark scheme will be widely publicized both by individual licensees and by the Zinc Alloy Die-Casters' Association, which has sponsored it. Many firms have already had their works inspected by the British Standards Institution and have been granted licences to use the Kite Mark. The Association's own advertisements will include a list of members who are licensed and the list will be kept up to date as other founders come into the scheme.

If the B.S.I. finds that a licensee is supplying castings outside the specification, he will be warned and, in persistent default, will forfeit his licence. Participation in the scheme is open to any die-caster, whether or not a member of Z.A.D.C.A., who is willing and able to comply with the conditions. Full particulars are obtainable from the British Standards Institution, 2, Park Street, London, W.1.

The American Die Casting Institute introduced a certification scheme for its members in 1949, and this has been very successful in reducinig the proportion of castings sold of poor quality. The industry in the U.S.A. consumes about a quarter of a million tons of zinc alloy annually, and is thus about ten times the size of that in Britain, which is itself the world's second biggest producer of zinc-alloy die-castings. As in Britain, the main use for these castings is in the automobile industry, and many American cars incorporate a total of 100 lb. of such items in mechanical and electrical parts and chromium-plated decorative features. Though it would be unreasonable to expect that the British zinc-alloy die-casting industry will ever reach the size of that in America, it is clear that it could make a much greater contribution to British productivity than hitherto. The Zinc Alloy Die-Casters' Association is confident that the guarantee of quality obtained by ordering certified castings bearing the B.S.I. Kite Mark will encourage manufacturers of all kinds of goods to take more advantage of this process.

The die-casting metal specification referred to, No. 1004:1942, depends on 1003:1942 as the latter details the composition of the zinc to be used, especially as to the limitations of impurities. The first specification sets out the composition of two alloys A and B. The former is of the order of 4.0 per cent. aluminium, 0.03 per cent. copper, and 0.045 per cent. of magnesium. Alloy B also has 4.0 per cent. aluminium, but with 1.0 per cent. copper. Though the specification refers to a Patent number, it is now time-expired. The mechanical properties listed are quite good, being for tensile of the order of 16 tons per sq. in.

Dangerous Improvisation

The Coroner, Mr. D. F. Cave, said there was an air of negligence in the case, and some casualness, when he investigated the deaths of two men, G. L. Scott and S. P. Southwick, who died from burns received in an explosion at the Albert Street works of Joseph Sankey and Sons, Limited, on January 20. At the inquest on February 11 a verdict of "Accidental death" was recorded on both men. The Coroner said that he was astounded that three drums of a substance known as toluene should have been allowed to lie about the premises for several months without anyone doing anything about them. "This accident, which occurred when an electrode held by Scott ignited the material in one of the drums (which the men were using as a platform) ought never to have happened," he said, "and would not have done so, if the proper precautions had been taken." The Coroner congratulated Mr. H. Dixon who wrapped his coat round Scott as he ran out of the flames and Mr. C. L. Bridgewater who entered the danger area and turned off the tap of an oxygen cylinder which was nearby.

Non-destructive Testing Service. Covering X- and gamma-ray, ultra-sonic and magnetic testing and the measuring of thickness, corrosion, conductivity and hardness, a booklet issued by Solus-Schall Limited, of 18 to 22, New Cavendish Street, London, W.1, shows mostly by illustration the services made available by this concern. There are pictures of the inspection of the welds of a pipe-line, of a sternpost casting and similar outdoor work. Indoors, there are views of a ring of castings being inspected in a steel foundry. Testing stations have been established at Bushey Heath, Herts, and Matlock, Derby, whilst the portable units just go anywhere. This pamphlet is available to readers on application to the London office of the firm.

Developments in Textile Foundries*

Further Discussion of Mr. Gale's Paper

When the Author presented his conference Paper at a branch meeting of the Institute in Manchester, the further discussion, reported below, centred mainly on the electric-furnace reclamation of borings. Other subjects included camber allowance on patterns, continuous annealing, maintenance, surface finish and continuous tapping.

MR. KIRKHAM, opening the discussion, asked if the relative costs of melting by the electric-arc process as compared with normal practice were available.

MR. GALE, in reply, said the costs based on continuous running had been taken and showed quite an appreciable saving over normal cupola melting. Care had to be exercised when making cost comparisons: thus for the electric furnace the cost of the electricity consumption, refractory usage, labour, raw material were included. The raw materials were, of course, borings from the machine shops, and for costing purposes they were charged to the foundry at the highest market price for which similar material could be sold outside. To these costs must be added depreciation on capital outlay and this was quite an appreciable amount; then the general overhead expenses were added to arrive at the cost of molten metal at the spout. This cost was then compared with that of cupola metal obtained in exactly the same way, but the raw materials were, of course, pig-iron, scrap iron, steel, ferro-alloys, etc., instead of borings, and the fuel source was coke instead of electrical current. The two sets of figures were then compared with conditions as near identical as could be obtained, and the difference in the price of molten metal at the spout was in the region of £5 per ton cheaper for that produced by the electric method.

Furnace Repairs

MR. POLLITT asked for details of labour necessary for repairs on the electric furnace.

MR. GALE stated he had found that by running the furnace continuously from Monday to Friday, it was necessary to bring in labour every week-end to effect normal lining repairs. The roof of the furnace was removed on Friday night at the completion of the melt to allow the furnace to cool off for men to do the necessary patching on Saturday. The refractory materials used worked out at approximately 8 lb. per ton of metal melted. Repairs to the roof were a different matter and it was found that the roof bricks need complete replacement after melting 200 tons of metal. For this purpose there was a spare roof always kept ready for changing over when one was nearly burnt out. The consumption of electrodes was originally estimated at 7 to 8 lb. of electrodes per ton of metal melted, but in actual working it had been found that much better results than this were obtained and about 3.7 lb. per ton was actually used.

MR. CONNOR asked two questions about the patterns for carding-machine sides: (1) was any allowance made for camber in the pattern; and (2) was a synthetic facing sand or a unit sand used?

MR. GALE said there was no camber allowance on the pattern referred to; it was mounted on a perfectly flat plate. The facing sand used on this particular casting was a synthetic, unit sand, but on some of the castings shown such as gearing ends, synthetic facing sand was provided, to be followed by a synthetic backing sand.

MR. GREEN asked for details of the sand mixing.

MR. GALE replied that the synthetic sand on that particular plant was made up of two parts of fine to one part of coarse silica sand with additions of colloidal clays and coal-dust. The mechanical analysis of the sand showed the bulk of the sand to lie between 60 and 150 mesh. The A.F.A. clay content of the sand was 7 per cent. Tests on the sand showed moisture of 4.5 to 5 per cent., green-compression strength of 8 to 10 lb. per sq. in.; permeability of 65 to 70; and shatter index of 70 to 75 per cent. This was a unit sand and was used direct on to patterns for general castings. When a facing sand was needed for certain of the large frame castings, the same sand was used with additions of coaldust or wood-flour.

MR. HARPER, referring to continuous melting of borings, asked as to the work of the night shift.

MR. GALE said there were moulders working on nights sufficient to supply moulds to meet the metal supply.

MR. JACKSON, referring to the continuous annealing process, asked what was the temperature used and how long was the charge in at temperature

MR. GALE said the cold castings entered the oven and were heated to 800 deg. C. in 3 hrs. They were then held at 800 to 820 deg. C. for ¼ hr. and were then gradually cooled down over 3¼ hr. to a temperature of 150 deg. C. The gas consumption on these furnaces averaged about 13s. 9d. per ton of castings annealed. As fuel, town's gas was used. At one time the company did make its own producer gas, but it had been proved that the town's gas was far more efficient and cheaper in the long run.

MR. HARPER, referring to the old machines illustrated, asked if the provision of spares was likely to continue for another 50 years.

MR. GALE said that on modern machines this type of casting was not made as the gears were cut from blanks, but whilst customers came back for spare parts of old machines made 50 to 70 years

* Paper presented at the annual conference of the Institute of British Foundrymen and printed in the JOURNAL, August 20 and 27, 1953 (previous discussion, September 3, 1953). The Author is attached to the Textile Machinery Makers' group.

ago, such spares would have to be made on the old moulding machines.

General Maintenance

MR. SPENCER asked for more information on maintenance.

MR. GALE said this was rather a difficult question to answer, as in his Paper he had been dealing with all the foundries within the group. The foundries he controlled had an output of some 450 tons of small castings per week when on full production. This was spread over three foundries, two of which had mechanized plants and these plants needed two full-time maintenance men. Other parts of the foundries, which were primarily engaged on loose-pattern and plate-moulding work did not require such constant maintenance attention. Maintenance men occupied continuously on the plants were mainly concerned in prevention of breakdowns by the usual inspection methods, but if there was a major breakdown, it was then necessary to call upon the engineering department for a gang of men to effect a rapid repair, and in cases like this there might be eight men on the job.

MR. ARMITAGE asked for the reason why Mr. Gale had found it necessary to use a sillimanite roof on the electric furnace which was, surely, far more expensive than a silica roof.

MR. GALE said the use of sillimanite was due to the recommendation of the furnace makers, and it was found to be very satisfactory. Melting borings was a new process for the group and it was not thought wise to experiment in the early stages. Perhaps at some later time a cheaper brick might be tried for this purpose.

MR. GREAVES, referring to the continuous-tapping spout on the cupolas, asked whether the Author had had any difficulties with refractories, and, if so, how were they overcome.

MR. GALE said no difficulties had been experienced. The spouts were lined once per week with normal cupola patching material and as the cupolas were worked on alternate days the spout was chipped clean each time it was used.

MR. KIRKHAM said that recently he had the opportunity of visiting most of the foundries in the Textile Machinery Makers' group, and he attributed the high quality of finish to something which the speaker had not mentioned. He thought the secret lay in the very-well-equipped and well-designed patternshops. In all these foundries one found metal and wooden patterns which were all of first-rate quality and this feature should be stressed.

MR. GALE, agreeing, pointed out that sand control was equally important, and suggested that even with a pattern of the finest quality obtainable, but using inferior sand, good castings would not be produced.

Annealing

MR. BASSETT, referring to the temperature of the castings during annealing, asked whether there was difficulty with a continuous oven of getting the heat to permeate through to the centre of the tray?

MR. GALE said difficulties had been experienced when the castings were loaded too high on to the trays for then it was possible that the heat would not soak through the pile in the time allowed. Thus a limit was set for the loaders so that they could not put too many castings on to a tray. This was achieved by fixing the furnace door at a definite height so that if the castings were piled too high, the door would not allow them to pass into the oven.

MR. COLLINGE asked whether it was found necessary to modify the pouring systems for castings when using the molten metal from the electric furnace; also, were there introduced any differences in machine-moulded castings relating to mould shrinkage.

MR. GALE said it had been found necessary to alter quite a number of running systems to suit the electric-furnace metal, due mainly to its lower carbon content and the incidence of external shrinkage which was common with low-carbon metal. He had not, however, found any reason for altering running systems according to whether the castings were machine moulded, impeller rammed, or hand moulded, and he would not have thought that any difference would be necessary.

MR. COLLINGE remarked that it happened in many instances that the walls of the mould were weak when rammed by the impeller method.

MR. GALE could not confirm this. If the sand were correctly prepared and the movement of the impeller head was continually and rapidly traversing the box, the mould density could be just as high as produced by hand-ramming methods.

MR. HASLAM asked if, for the large sides such as the scutcher sides, a one-piece pattern or a fabricated pattern was used, and which method was to be generally recommended for patternmaking.

MR. GALE suggested that this was largely a matter of personal opinion. His own was that one could not improve upon a cast-iron pattern. Larger types of pattern were fabricated of cast iron. The patterns were made in sections and built up on to the plate. Such a method was very useful because when there was a modification it was very easy to take a component out of a fabricated pattern and insert another piece. Some of the foundries used aluminium fabricated patterns, but he reiterated that his personal preference was for cast iron.

ASSOCIATED BRITISH ENGINEERING, LIMITED—The company has agreed to sell to Thomas Tilling, Limited, at the current market price its holding of 2,000,000 ordinary shares of the Brush Electrical Engineering Company, Limited.

From Behind the "Curtain"

The high hopes with which the 33 British businessmen set out for Moscow just over three weeks ago have materialized into signed orders from the U.S.S.R., valued at £16,000,000, and others worth three times that amount are under negotiation. The Russians are prepared to buy £400,000,000 worth of British goods over the next three years. The news that Mr. J. B. Scott, sales director of Crompton Parkinson, Limited, brought back with him on February 16 was good. He was the leader of the party and on his return was able to report orders which included machine tools, textile machinery, and electrical equipment. The biggest was the contract announced recently for 20 trawlers worth £6,000,000.

Mr. Scott said that the Russians had shown special interest in 10,000-ton cargo ships and were even willing to extend delivery dates to 1958. He thought that as the Soviet showed no interest in British consumer goods it wanted to spend as much as possible of its available funds—all payments are in sterling—on British engineering goods.

Although there has been some decline in Anglo-U.S.S.R. trade, it has been continuous, but the important thing about the visit is the fact that so many prominent industrial representatives made such a concerted effort with such success. Competition from the Continent, of course, was keen and all members of the delegation, each of whom negotiated individually with his opposite number, agree that the Russians were keen and knowledgeable on prices.

Machine-tool Success

Three machine-tool making companies were represented on the trip. Mr. F. James Fielding, managing director of Fielding & Platt, Limited, Gloucester, and also deputy chairman and managing director of the parent concern, Heenan & Froude, Limited, won the biggest single order that he had ever received—£2,250,000 worth of presses, mostly for the furniture industry. Negotiations often went long into the night, with the Russians showing an uncannily accurate knowledge of world prices, and being meticulous in their specifications.

This large contract was a result of negotiations which had been in hand for some time and were finally clinched on Mr. Fielding's visit. He had had previous contact with the Russian importers in 1950-51, when joggling presses for the shipbuilding industry were ordered of a similar type to some placed in the present contract. The company will commence delivery at the end of this year and complete delivery in 1957. Three years was the general delivery period required in all the deals.

Another member who had dealt with the U.S.S.R. before was Mr. Robert Asquith, chairman of William Asquith, Limited, Halifax. He went without any promise of orders, but came back with a contract for £750,000 worth of machine tools. His effort was not without difficulty for at first the Russians stipulated 1950-51 prices.

Even so there is a further difficulty for Mr. Asquith, as his machine tools may not be free from strategic controls. Those manufacturers who knew what their contracts would consist of before they left were able to satisfy the Board of Trade and Ministry of Supply that their products were not of strategic importance, but the orders initiated during the visit will have to be checked against the list.

In the House of Commons on February 16 the Minister of State, Board of Trade, Mr. Heathcoat Amory, stated that as a rough estimate he would think that of the £400,000,000 worth of goods which may be ordered by the U.S.S.R. some £175,000,000 or £180,000,000 worth would be free from these controls.

More Visitors

Although in the whole of last year virtually no machine tools were shipped to Russia from this country, the position this year may be very different, for Soviet interest in British machine tools is now keen, as is evinced in a recent invitation from the Russians for representatives of Associated British Machine Tool Makers, Limited, to visit Moscow. Arrangements for the visit are now being completed, and the party, which is to be led by Sir Greville S. Maginness, who is chairman of the group, is expected to leave in the next few weeks. Many of those who are expected to make the journey have had previous experience of negotiating with the Russians.

Associated British Machine Tool Makers comprises the following companies:—Churchill Tool Company, Limited; Kendall & Gent, Limited; George Richards & Company, Limited; Butler Machine Tool Company, Limited; H. W. Ward & Company, Limited; John Lang & Sons, Limited; J. Parkinson & Son (Shipley), Limited.

And there is news of yet another group of businessmen going to the Soviet capital in search of orders. A small group of shipbuilders, under the leadership of Sir Ralph Cochrane, of the Atlantic Shipping Company, will shortly leave Newport (Mon) for Moscow.

Coke for Western Australia

The government of Western Australia recently asked for the co-operation of the Fuel Research Station, D.S.I.R., on an important problem. Western Australia has no coking coal but possesses iron and needs foundry coke for its treatment. The Fuel Research Station has been concerned in experiments to find out if a non-caking coal could be used instead, in the form of carbonized briquettes. Good-quality briquettes were made in collaboration with a commercial firm, and have been sent to Australia for trials.

Laboratory-scale experiments in Western Australia indicated the possibility of making coke from local resources of non-caking coal. The process involved carbonization of the coal, followed by briquetting of the char with pitch and, finally, carbonization of the briquettes. Samples of char manufactured from the non-caking coal available in Western Australia were received in England for tests on a larger scale. After some preliminary experiments at the Fuel Research Station to find the best conditions for doing so, the char was mixed with pitch and pressed into briquettes by Yeadon, Son and Company of Leeds in commercial-scale plant. When these briquettes were carbonized at the Station they gave a hard, dense coke. Enough briquettes were sent to Australia for trial in a metallurgical cupola. Their performance was promising and the Australian authorities are now considering the establishment of the process.

One disadvantage of making briquettes from the char, which will have to be overcome before the process can be used on a large scale, is that the char is extraordinarily abrasive and causes a lot of wear on grinding and briquetting plant. Because of this, small-scale experiments were done on making briquettes directly from the uncarbonized coal and then carbonizing the briquettes. These experiments gave cokes which were too weak to be useful.

Manchester Ironfounders' Annual Dinner

Sir George Barnett, H.M. Chief Inspector of Factories, was the principal guest at the annual dinner of the Manchester and District Ironfounders' Employers' Association, and, replying to the toast of the "Factories Department of the Ministry of Labour and National Service," pointed out that the ironfounding industry had been fortunate in the implementation of the Iron and Steel Foundries Regulations because, before then, and in fact, since 1914, it had been on the statute book as a dangerous trade, but now, as a result of the Regulations, it came within the scope of his Department. Referring to these Regulations, he said that a certain amount of flexibility was necessary if the trade was to carry out the recommendations. He was convinced that a great deal was being done by the industry in the direction of modernization and reorganization to bring about improvements in conditions. The Factory Department, he said, was most ready to co-operate in implementing the Regulations. He felt that the accidents question was one which needed further consideration and was grateful to hear of the forthcoming conference on the subject at Ashorne Hill, especially as accidents in foundries, unlike those for other industries, had been increasing. The toast had been proposed by the chairman, Mr. Mortlake, who is the president of the Manchester Association.

The vice-president, Mr. Clayton, then proposed the toast of the National Association, which was replied to by both Mr. Kenneth Marshall, director of the Council of Ironfoundry Associations, and Mr. T. Lee, president of the National Ironfounding Employers' Federation. The former referred to the work of Mr. Webb—the secretary—whose untiring efforts had done much in regard to the question of Employers Liability Insurance which gives hope of the reduction from six to three years for common-law claims.

Mr. Lee, in his reply, said the Manchester Association was both the oldest and second largest body within the N.I.E.F., with a membership of 80 firms.

Fuel-saving Potential

Dr. F. M. H. Taylor, a fuel technologist and chairman of the Government-sponsored committee which has been investigating for two years the need for fuel economy, told members of the Birmingham branch of the Institution of Incorporated Plant Engineers at their annual dinner recently that the amount of plant installed in British factories will double in the next ten years and the extra fuel needed to operate it will result in a shortage of 20,000,000 tons to 30,000,000 tons of coal annually. "The only way we can avoid a crisis is by urgent methods of economy in our available supply of coal," he said. Members of the Institution controlled the consumption of 100,000,000 tons a year. Surveys had revealed that 20 to 22 per cent. could be saved in factories and so there was a potential saving of 20,000,000 tons. Dr. Taylor proposed the toast to the Institution to which Mr. J. C. Veale, president, replied. Mr. M. C. Rogers, chairman of the Birmingham branch proposed the toast to the guests, to which Mr. L. C. Baxter, past chairman of the Institute of Works Managers, replied.

THE NOWA HUTA IRON AND STEEL WORKS, laid down by the Polish Government with equipment manufactured by the Sovet Union, is to be known in future as the Lenin Metallurgical Works.

Ironfounders' New Safety Committee

The Council of Ironfoundry Associations has now set up the special committee, previously announced, which is to co-ordinate and intensify the efforts being made throughout the industry to keep down the accident rate in ironfoundries. Many of the risks are common to other industries such as those associated with the handling and transportation of large quantities of materials. A number of special risks arising from the use of hot metal increase the complexity of the problem.

Over the whole of the post-war years the subject of accident prevention has been paid steadily increasing attention by employers and workpeople in the industry. Many of the larger firms have their own safety organizations in which the workpeople are called upon to play their part. In the smaller concerns the personal attention of the proprietor or managing director is often the most effective means of securing results. This has been further stimulated by the growing number of common-law claims for damages for injuries, many of which the employers regard as at least originating in the neglect, sometimes shown by workpeople, to take advantage of the protective facilities offered. One of the problems still to be solved is how to encourage every foundry worker to make full use of the clothing and other equipment which is provided for his protection.

The following are the members of the Safety Committee appointed:—Mr. C. Gresty (chairman), North Eastern Marine Engineering Company (1938), Limited; Mr. F. Livermore, Midland Motor Cylinder Company, Limited; Mr. H. V. Shelton, chairman, British Ironfounders' Association; Mr. J. N. Deas, Federated Foundries, Limited; Mr. C. J. Grazebrook, Grazebrook Foundry Company, Limited; Mr. H. A. Bonney, Follsain-Wycliffe Foundries, Limited; Mr. G. E. Deacon, Richard Thomas & Baldwins, Limited; Mr. A. Kirkham, Sir W. H. Bailey & Company, Limited; Mr. G. Worrall, C. A. Parsons & Company, Limited; Mr. J. G. Adamson, J. & E. Hall, Limited; Mr. L. V. Marshall, Newton Chambers & Company, Limited; Mr. A. W. W. Taylor, Taylor & Sons, Limited; Mr. D. A. Richards, Thos. Richards & Sons, Limited; Mr. W. G. Thornton, Yorkshire Repetition (Castings), Company, Limited; Mr. A. K. Kirk, Kirk & Company (Tubes), Limited; Mr. T. W. Rigley, Wm. Rigley & Sons (Nottingham), Limited; Dr. H. T. Angus, British Cast Iron Research Association; and Mr. E. Longden, president, Institute of British Foundrymen.

Midlands Productivity Association

On March 4, members of the Birmingham Productivity Association Council will be invited to a luncheon at the Imperial Hotel, Birmingham, at which Sir Ewart Smith will address a meeting of the Engineering Industries Association. Other items in the Productivity Association's programme include a joint meeting, on March 9, with the Institution of Production Engineers, for discussion on the "Impact of the B.P.A. on the Industrial Executive" a joint lecture meeting on April 13 with the Institution of Works Managers, when Mr. A. B. Waring, managing director, Joseph Lucas (Industries), Limited, will speak on "Competitions in the Everyday Life of the Factory"; and in May a joint meeting with the Institute of Industrial Supervisors, in the form of a "Brains Trust" or forum.

Mechanization Extended at Leyland

New Stockyard and Cupola-charging plant at Farington Foundry

To maintain an increasing output of iron castings at the Farington foundry of Leyland Motors, Limited, the company have installed an all-mechanical handling plant in the pig-iron stockyard for charging the cupolas. Preliminary experiments have shown that the installation reduces a six-man-hour loading job to less than one-man-hour, but apart from this saving the new plant ensures greater quality control, more continuous charging, and a higher factor of safety for the men employed on the work. As a further extension, the company have installed a briquetting press for dealing with cast-iron borings and 20 tons per week of this material can be prepared suitable for cupola charging.

During recent years, various sections of the foundry have been mechanized in turn, including sand reclamation and mixing, and moulding-box filling and ramming. Part of this reorganization was described in the JOURNAL* on the occasion of the I.B.F. conference works visits last year. Mechanization of the stockyard and cupola charging arrangements now extends the development on these lines.

When the foundry was built, over 30 years ago,

*JOURNAL, June 11, 1953, p. 677.

FIG. 1.—*View of the new cupola-charging system at the Farington foundry of Leyland Motors, Limited, while under construction, showing the area covered by the travelling crane, including stockyard, coke hopper and service bins.*

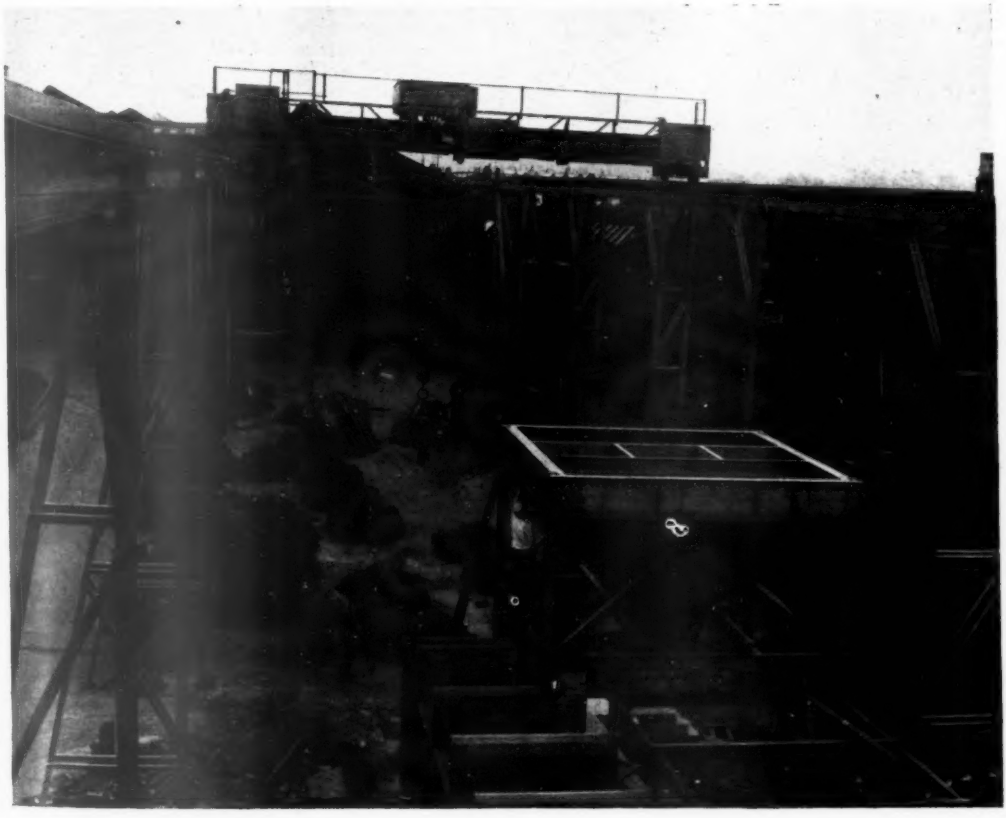


FIG. 2.—*Drop-bottom skip situated on the scale car which travels on rails between the servicing bins and beneath the coke hopper. The waist-high arrangement of bins and skip does away with the need for excessive lifting.*

it catered for steel castings, but much later for iron castings, yet the output of iron castings has progressively increased year by year until now this type of casting completely dominates production, with a weekly melting rate of upwards of 200 tons. Cast-iron cylinder blocks are produced by the hundreds daily for Leyland Diesel engines and also for various high-quality cars such as Rover and Jaguar. The production of these castings will be greatly facilitated by the new plant now coming into full operation.

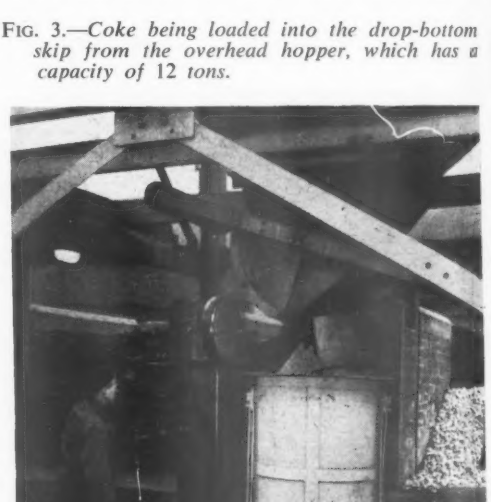
One of the most important advantages that will result from the new installation is the manner in which it will simplify quality control of the metal mixtures for the cupolas. Bulk stocks of pig-iron scrap and other ingredients for the castings are stored in separate piles in the stockyard, each pile having a different chemical composition. Working quantities are transferred from the stock piles to walled-off containers which flank both sides of a miniature railway line (see Fig. 1). Along this track runs a scale car built to carry a specially designed metal container or skip (Fig. 2). As the scale car moves along its track, its skip is loaded with the correct weight of various grades of pig-iron, as well as limestone, from the bins alongside. At the end of the track, coke is weighed into the skip from an overhead hopper, which has a capacity of 12 tons (Fig. 3). Thus, under the control of a metallurgist, each ingredient for making the castings is proportioned, speedily and accurately, to ensure a consistent high-grade quality. All this loading is carried out under cover, an important feature of the arrangement being that the height of the top of the skip as it travels on the mobile weighing machine is level with the platforms on which the working quantities of material are segregated. This facilitates feeding the material into the skip and avoids any unnecessary lifting.

Charging

After loading, the skip is propelled along a moving conveyor to a position below a hoist or telpher 34 ft. high. This can lift the skip at a rate of 50 ft. per min. and traverse it at 300 ft. per min. along a mono-rail and branch rails to any one of four cupolas into which the contents are discharged through the drop-bottom of the skip. The empty skip is then carried to another roller conveyor along which it travels by gravity to the scale car for use once again at the loading bay (Fig. 4). The process is thus a continuous one. A number of skips are in circulation at the same time, one leaving the loading bay every 6 min.

The layout and equipment to deal with this sequence of operations was planned by Leyland Motors, Limited, and constructed and installed by Paterson Hughes Engineering Company, Limited. Carriage of materials from the stockyard to the loading bins and coke hopper is made by 5-ton gantry crane which has a runway 200 ft. long at a height of 35 ft. It has a span of 35 ft. 6 in. and operates a 1-ton grab for coke haulage and a 10-cwt. magnet for the iron. This crane has a

FIG. 3.—*Coke being loaded into the drop-bottom skip from the overhead hopper, which has a capacity of* 12 *tons.*



hoisting speed of 20 ft. per min.; it can travel 300 ft. per min. along the runway and traverse at 100 ft. per min.

Working in conjunction with the new layout is a plant for the manufacture of cast-iron briquettes from turnings and borings, which results in a substantial economy in bought-out stock. Dealing with 20 tons of this material per 44-hr. week, the plant forms the 2¼-lb. briquettes at the rate of 540 per hr. by compression in a toggle press supplied by William Johnson & Sons, Limited. The pressure applied is 250 tons and the comparative density resulting with cast-iron borings is 70 per cent.

The cost of the new charging and charge preparation plant as a whole is estimated at £40,000 and, although this amount can be related directly to increased productivity, its other substantial benefits are more in the intangible forms of quality control and safety, a factor to be considered seriously when heavy raw materials are manhandled.

FIG. 4.—*Empty skip being returned to the roller conveyor. It will pass between the servicing bins and beneath the coke hopper seen in the background, returning with its load via the roller conveyor seen on the right, when it will be lifted by the telpher, carried forward, and its load fed directly through a drop-bottom into one of the four cupolas.*

A MORE COMPREHENSIVE service in gears and gear units is now offered by W. Crockatt & Sons, Limited, 60/64, Darnley Street, Glasgow, following the company's appointment as sole sales and service engineers in Scotland for Stone-Wallwork, Limited, and as sole representative for Ramnas Bruks, A.B., Ramnas, Sweden.

New Catalogues

Refractory Ladle Liners.—The Morgan Crucible Company, Limited, Battersea Church Road, London, S.W.11, have compiled a leaflet, which opens by quoting from the Iron and Steel Foundries Regulations, banning open fires in the shops, and thereafter suggests the use of pre-fired Salamander ladle liners made to fit standardized pressed-steel ladles as an alternative. On the reverse side are listed 15 sizes of ladle varying from 25 lb. to 12 cwt., together with the important dimensions and weights. The leaflet is available to readers on writing to Battersea.

Welding Rods. Suffolk Iron Foundry (1920) Limited. Sifbronze Works, Stowmarket, have issued a revised edition of "Sifbronze." This describes a copper/zinc alloy of the same name, having silicon and other additions which make it very suitable for joining metal sections at fairly low temperature of such materials as cast and malleable iron, mild steel, copper and nickel alloys. On page 3 the microstructures of two types of "Sifbronze" are shown, but no magnifications are given. Actually there are five types, some of which carry a high nickel content. Within the 28 pages the subject is thoroughly covered and many practical hints are given.

Coremaking Process. An information sheet (No. 105) received from the Harborough Construction Company Limited, of Market Harborough, tells of a new process of coremaking, which involves the passage of an innocuous gas through the core, resulting in a product which, even for the most delicate shape, can be handled. This makes possible the elimination of core-wires and contoured carriers, as the compression strength on stripping is stated to be of the order 20 to 50 lb. per sq. in. The cores may be used in some cases in this state, but in any case the drying period can be very brief. The process is covered by Patent Application No. 8408. The information sheet is available to readers on application to Market Harborough.

Illuminators. It needed perusal of the 14-page booklet with this title, published by Kodak, Limited, Kingsway, London, W.C.2, to identify this equipment to the reviewer as special apparatus for the viewing of radiographic transparent films, whereby the "negative" is mounted and illuminated from behind. However, even a layman who has handled X-ray films can appreciate that such aids to interpretation are essential in the radiographic laboratory, and that uniformity of lighting and absence of "graininess" are necessary features. These are claimed for all the five models described in the catalogue, which also gives particulars of transparency viewers and other film handling accessories. Readers can presumably obtain a copy of this useful publication on writing to the Kingsway address.

Iron Castings. Using the title "Castings of Quality," Edward Matthews Limited of Bilston have issued a 28-page brochure designed to publicize their grey-iron castings. The book, carrying a spiral binding, is very well illustrated and gives a proper impression of efficiency. Obviously the firm desires to improve its trade literature commensurate with the efforts it has made to produce high-class castings and the following suggestions are made:—Nowhere is there any mention of repetition castings and the foundry illustrated shows no moulding equipment. This should be remedied by both letterpress and illustration. The second is of a minor character and is that properly prepared castings and not pig-iron should be used for weighting moulds. Beyond these, we have nothing but praise for the brochure.

Alloy Conservation in Stainless Steels

The re-ladling of stainless-steel melts for the purpose of conserving alloys was explained by A. J. Texter in a paper read at the recent 11th annual Electrical-furnace Steel Conference held at Cincinnati, U.S.A. This process includes the use of a so-called dummy ladle large enough to hold the entire melt of slag and metal. When transferring the charge to this ladle, the furnace is slowly tilted to allow the greater portion of the slag to enter before the metal begins to pour, this sequence being important because of the large amount of slag/metal contact resulting therefrom. The silicon-rich metal coming into contact with the rich slag oxides causes their rapid and almost complete reduction. According to the Author, this re-ladling is a more effective means of getting high-silicon metal into contact with oxide-rich slag than can be accomplished by mechanical stirring.

Most of the slag can be decanted from the dummy ladle into a slag pot, or poured back into the furnace, this resulting in more slag/metal contact and further increasing recovery of chromium; also, if the bath silicon ih high, it is still further oxidized. Immediately the steel is returned to the furnace, and the necessary test taken, the bath is cleaned of all remaining slag and a new lime/silica slag added. The discarded slag is usually under 2.5 per cent. Cr_2O_3 and may be as low as 0.25 per cent. The average slag weight at the slagging-off or re-ladling points of 42 heats is reported as 412 lb. per ton, the average Cr_2O_3 content of the slag being 1.87 per cent. and the average bath silicon after the re-ladling process 0.37 per cent. This is equivalent to an average chromium loss to slag of 5.3 lb. per ton, which is the important figure for evaluating the practice, as distinct from high or low lime/silicon ratios or the Cr_2O_3 in the slag.

Waging War on Smoke

The harmful effect that smoke is having on the nation's health and economy is nowadays voiced more frequently and with ever-increasing volume. Yet the facts, when propounded, continue to appal even the most conservative of die-hards. Smoke causes deposits of 200 to 500 tons of soot per square mile, and represents a loss to the country equivalent to 2,500,000 tons of fuel a year. It results in damage estimated to cost upwards of £100,000,000 a year, while the extremely injurious effect of air pollution on health was only too obvious from the disastrous fog of December, 1952, when over 4,000 people died in the Greater London area.

There are, however, a number of organizations engaged in an arduous campaign against smoke. One of these is the Solid Smokeless Fuels Federation, which represents the producers of 38,500,000 tons of solid smokeless fuel a year. On February 15 an exhibition arranged by the Federation designed to show that smoke pollution caused chiefly by domestic fires can be abolished and that greatly increased efficiency can be obtained by the use of solid smokeless fuels in modern appliances was opened at Charing Cross (underground) station, London. The by-products of coal obtained by carbonization, samples of various smokeless fuels, modern domestic grates and boilers, insulation materials, and a smoke recorder (intended to show that the three fires burning are emitting no smoke, are included in the exhibition). A similar exhibition held last year was visited by 46,000 people.

(*Continued at foot of col.* 2)

Opening the exhibition, Mr. Harold Macmillan, Minister of Housing and Local Government, declared himself distressed that the word "smog" should have come into vogue during his term of office. He warned that the task of abolishing "smog" was a gigantic undertaking which would take many years to accomplish.

Fillets

By "Chip"

Fillets are necessary on castings to strengthen the re-entrant angles, and are either made from the pattern direct or by the moulder using a special chamfering tool. The question of incorporating fillets on the pattern or leaving it to the moulder is a vexed one amongst patternmakers. Some contend that all patterns should be as perfect as possible, while others argue that for the one-off and occasional job time spent fitting fillets to the pattern is not justified.

The latter point of view seems to be sound, for it is not economic for a patternmaker to spend, say, one hour fitting a fillet which the moulder could do quite easily in less than five minutes. There is, however, one point in favour of the former argument, which is, when fillets are fitted to the pattern they are of a size consistent with the general design of the casting, but occasionally when left to the moulder they may be either too generous—such as result in a "draw" in the casting due to the heavy mass of metal—or of insufficient size, with the result that the job is not as strong as desired.

To overcome this objection, the patternmaker could, when the size of the fillet is important, make a small piece and nail it on one of the angles and make a note on the pattern to the effect that "all fillets to be as sample." By this means, a cheap job can be obtained without fear of malformed fillets.

High-production patterns should, of course, be fitted with fillets, either of leather, wax, plastic wood or other material, except where the job is such as to enable the fillets to be carved from the solid timber. This method is by far the best, and should be adopted whenever practicable.

United Kingdom Trade in January

Provisional figures show that United Kingdom exports in January, which had 26 working days —one more than the previous month—were provisionally valued at £225,800,000, slightly more than in December, but less than the average for the fourth quarter of last year. Exports in January, 1953, were £217,700,000. Imports in January totalled £282,500,000, 2 per cent. more than the fourth quarter average and slightly more than the rate in the first half of 1953. With re-exports at £8,100,000 in January, the excess of imports over exports and re-exports in the month was £48,600,000, nearly a third more than the average in the fourth quarter, but well below the rate in the first half of last year.

U.K. exports to North America in January are provisionally valued at £22,500,000, 9 per cent. less than the monthly average in the fourth quarter of 1953. Exports to the United States in January, at £12,000,000, were slightly less than in the fourth quarter last year; but exports to Canada amounted to only £10,500,000, and showed a decline of 16 per cent. from the fourth-quarter average, largely attributable to seasonal factors.

Residual Stresses in Castings*

By Dr. R. N. Parkins

Residual stresses can be defined as those stresses which may remain in a casting after removal from its mould and from the influence of all external agencies. They are, perhaps, better known through the effect that they sometimes produce upon the properties of castings, being manifest in cracking of the casting (either after reaching room temperature or upon subsequent heat-treatment), in distortion on machining, and in a lowering of the strength of the casting.

The mechanism whereby residual stresses form in castings can be considered by reference to a simple shape, consisting of three straight and parallel members of equal length, joined at their extremities by rigid cross members of equal length so that they are equidistant from one another. If the centre member be heated, the others remaining cold, the expansion which this component attempts to achieve will be opposed by the outer members, so that compressive strain must be introduced into the centre member and tensile strain into the outer members. If the stress associated with this strain does not exceed the yield point of the material, *i.e.*, no plastic deformation takes place, then no stresses will remain on cooling, to the ambient temperature. If, however, the difference in temperature established between the centre and outer members corresponds to a strain that is greater than the yield-point strain then plastic deformation will take place. Depending upon the temperatures involved and the relative cross-sectional areas of the members, this plastic strain is not likely to be confined to the centre member and in any case is unlikely to be the same throughout the component. If, then, the source of heat is removed, the centre member will undergo the same amount of contraction on cooling as expansion on heating, but when room temperature is reached the outer members will be longer than the centre by an amount equal to the plastic strain, so that compressive stresses will be set up in the outer components and tensile stress in the centre.

Application to Castings

In the case of an actual casting of this shape, the process is very similar. The outer members, assumed to be of smaller cross-section, cool most quickly and therefore compress the centre member which will be hotter and of lower mechanical strength. When the cooling rate of the centre member exceeds that of the outer members, the former cannot contract freely because the outer ones are by then relatively cold and rigid. Consequently, a tensile strain develops in the centre member, balanced by a compressive strain in the outer members.

This indicates, in a simplified fashion, the way in which a stress system can be introduced into a component merely by establishing temperature differences. The important point, however, is that unequal amounts of plastic deformation must be produced and these can be brought about by agencies other than the one mentioned; for example, hindrance by the mould to the contraction of the casting and phase transformations in the solid metal as it cools. The practical problem is one of deciding which of these three factors is likely to make the greatest contribution to the stresses remaining in castings.

In the work on the subject at King's College, Newcastle-upon-Tyne, the problem has been approached by making castings of simple shape in various alloys using various sands. The results, although only strictly applicable to the castings used, are probably of wider application and indicate that temperature differences established in the casting during cooling are the most important single factor. Thus, for Y-alloy aluminium, in which there is no appreciable volume change resulting from a phase transformation, the stresses appear to be solely due to temperature differences. In grey iron, however, it was found that the contributions from the three effects could be of similar magnitude to one another. It could be argued, however, that the contributions of sand hindrance and phase transformations to the stresses remaining in castings of simple shape are accentuated by the presence of temperature differences, since under such circumstances the lack of homogeneity of the plastic deformation is increased.

Significance of Temperature Difference

The greater significance of temperature differences in producing residual stresses can be inferred from other results. Thus it is found that the magnitude of the stress increases with increasing pouring temperature and with increased resistance content of the sand, both of which promote greater temperature differences between heavy and light sections of a casting. Furthermore, if a series of similar castings be stripped from the mould after various times have elapsed from pouring, it is found that the stress is higher the longer the casting remains in contact with the mould, which is also explicable on the basis of the temperature differences established.

While most of the foregoing is only strictly applicable to castings of the shape discussed, it does, nevertheless, suggest that the most profitable line of approach to the problem of the reduction of the magnitude of the stresses remaining in castings will usually lie in attempting to reduce temperature differences. To this end, re-designing of the casting or the mould might be considered, for example by attempting to run the casting to distribute the heat more evenly. The insertion of chills near the hot zones or, conversely, the local generation of heat near the cold zones, might also be helpful in this direction. Stripping of the casting from its mould as soon as possible after solidification or the use of hot moulds may be applicable in some cases, although it is obvious that each case would have to be considered on its own merits.

Considerable interesting and informative discussion followed the lecture.

* Summary of a Paper read before the Newcastle branch of the Institute of British Foundrymen, Mr. Colin Gresty presiding.

Cornish Cream and Pasties

The East Acton works of Holman Bros., Limited, of Camborne, has been extended, and recently the company took a party of visitors there to witness demonstrations of a new rock drill—the "Silver 3"—and of a new range of hand-held pneumatic tools, stocks of which, as well as spares, are to be held at Acton. The visit was preceded by a luncheon gathering in the firm's Brook Street offices of a distinct Cornish flavour, the guests being regaled with Cornish pasties sent up specially from Camborne, followed by raspberries and thick Cornish cream.

Family tradition and a pride in heritage continue to distinguish this old-established firm of Cornish engineers and founders. It was in 1801 that Nicholas Holman set up a business near Camborne to make boilers and wrought-iron work for the local tin mines, and, on his retirement in 1862, he was succeeded by his son, James. In the meantime, John, the third son, had in 1839 established a foundry and engineering shop of his own in Camborne, with two of his sons, John Henry and James Miners, to assist him. In 1880 these two sons took over the control of the business, subsequently acquiring control of the original works started by Nicholas, which they transferred in 1895 to a site nearer Camborne.

Overseas connections were steadily developed by the brothers, who increasingly concentrated on pneumatic plant. Operating under the title of Holman Bros., they successfully developed a superior air-operated rock drill. Simultaneously, the general-engineering side, such as the manufacture of compressors and hoists, was extended.

Development at Home and Abroad

Holman Bros., Limited, was registered as a private limited liability company in 1906, and in the following year Leonard joined his father, James Miners, as a director; within the five years subsequent to the death in 1908 of John Henry, the senior partner, his two sons, Treve and Kenneth, and Percy (the brother of Leonard) had entered the business. When James Miners died in 1933 these four members of the fourth generation assumed control. Leonard died in 1949 and his cousin Treve then became the company's chairman.

Portable and stationary compressors, hoists, air engines, etc., are made at the No. 1 works, which is the site of the original Camborne works started by John Holman in 1839. Three further separate works are engaged on the production of rock drills, pneumatic drills, and tungsten-carbide bits and steels. The original Nicholas Holman business has now become the drop-forging works. In 1951 a further works was acquired at Carn Brea, and this is now used as a central raw material stores.

Dorman Long's Bridge Contract

The tender of Dorman, Long & Company, Limited, Middlesbrough, for the construction of a new road bridge in Iraq over the River Euphrates has been accepted by the Government of Iraq Development Board. The contract, which was secured in the face of strong international competition, is valued at £350,000.

The site of the bridge is at Ilindiya, 65 miles south of Bagdad, and is quite close to the site of ancient Babylon. The bridge will be 570 ft. long and 46 ft. wide, and will have a steel central span with reinforced concrete approaches. The piers will be of steel piled construction. The total weight of steelwork is 1,500 tons and the bridge is to be completed within 18 months from the beginning of construction.

Fined for Scrap Offences

At West Bromwich (Staffs) Stipendiary Court recently, Frank Wright (33), the administrator of the estate of Jonah Wright, scrap merchant, of Hawkes Lane, Hill Top, West Bromwich, was charged with selling scrap metal at excessive prices and the Brickhouse Foundry, Limited, of Brickhouse Lane, West Bromwich, was summoned for buying at an excessive price.

Both defendants admitted 60 cases, and Mr. L. J. Brett, prosecuting for the Ministry of Supply, remarked at the outset: "This is one of those unfortunate cases where there has been a large amount of trade between the parties concerned, and represents a selection and reduction from what might have been 244 summonses.

The goods which passed from Wright to the Brickhouse Foundry were invoiced apparently at the right price, at 145s. per ton, which on the face of it, was below the maximum price of 148s. 3d., but in addition each invoice was accompanied by a separate invoice charging for hire of transport. The additional charge worked out at exactly £1 per ton, explained Mr. Brett. The Scrap Order at all times provided that the material should be delivered free by the seller to the purchaser, so that by passing an invoice for a transport charge, which, in fact, was not chargeable, an addition was obtained to the maximum price. The explanation of the purchasers was that they had bought the scrap to keep the foundry in production.

The transactions had taken place between July, 1952, and April, 1953, the total overcharge in the 60 summonses being £196, but the total tonnage of scrap which had passed between the parties was some 1,349 tons, the overcharge being more than £1,083.

Keeping the Foundry Going

Mr. G. H. Beresford, for the defendants, said that the foundry was a small one which employed about 40 people. The firm had been in existence for 60 years, and this was the first summons ever brought against it. The business was concerned with the manufacture of manhole covers. For 30 years the foundry had obtained scrap iron from the late Jonah Wright, and after his death from the son, who was the administrator. During the period covered by the summonses there was a great shortage of scrap iron, and the small excess paid in the present case was nothing comparable with prices paid by other foundries for scrap from as far afield as Lancashire and London.

The defendants calculated the overcharge at 16s. 10d. and later 15s. 10d. In May, 1953, the "bottom fell out of the market" and they were paying about 8d. under the control price. They did what they did merely to keep the foundry open, and did so by the good offices of Mr. Wright, who did not seek to profiteer out of it to the extent of £5, £6, or £7 a ton extra which other foundries were paying.

Imposing fines of £39 10s. with £7 7s. costs on both Wright and the Brickhouse Foundry, Limited, the Stipendary, Mr. Kenneth Wood, remarked that it was of high importance that the Order should have been observed in common with other orders and regulations and that the public should appreciate that such orders must be obeyed. He must take into account, he said, that both these defendants broke the law deliberately. On the other hand, he must remember that they were both acting under what might fairly be described as considerable temptation at a time of great difficulties, and he could not blind himself to the fact that although there was infringement of the law, they were in a sense, and it could be said quite properly, acting in the national interests, inasmuch as they were keeping a very important trade going.

Parliamentary

Staveley Iron & Chemical's Directors

When MR. BOWLES asked the Chancellor of the Exchequer why the Iron and Steel Holding and Realization Agency pressed for the dismissal or resignation of three directors of the Staveley Iron & Chemical Company, MR. BOYD-CARPENTER, Financial Secretary, who replied, said that the question would appear to refer to a matter of day-to-day management which would be for the agency, and about which the Treasury would not normally be informed. He understood, however, that in this case the resignations were tendered on the initiative of the three directors concerned, and that their retirement from the board of the Staveley Iron & Chemical Company was at their own definite wish.

MR. BOWLES said that "The Times" stated that the resignations were made by arrangement with the agency, and that it was clearly stated in the "Daily Express" that Mr. McKenna was quite able to do without the steel shares and that the Staveley Company was now quite prepared to do without him. "Is it not quite clear," he asked, "that if the terms of the offer under denationalization were not sufficiently attractive the agency has power to call for the resignation of these directors?"

MR. BOYD-CARPENTER: "The last part of the supplementary question is, of course, quite a different question. The resignation of these gentlemen is as I have stated."

When MR. G. R. STRAUSS asked if the Financial Secretary meant that there was no dispute or quarrel about the selling of these shares that prompted the resignation of the directors concerned, MR. BOYD-CARPENTER replied: "That is, of course, a totally different question."

MR. BOWLES: "No."

MR. JACK JONES asked if Mr. Boyd-Carpenter was "aware that it is possible that these three wise men from the north acted in the national interest, rather than in the interests of vested interests, hence the trouble at Staveley."

MR. BOYD-CARPENTER said he had no doubt that these directors, like a great many other directors, acted in the national interest.

The directors of the Staveley Iron & Chemical Company referred to are:—Mr. T. A. McKenna (chairman); Mr. M. R. Norman, and Mr. A. E. Peak. Mr. McKenna is chairman of the Staveley Coal & Iron Company, of which Mr. Norman and Mr. Peak are both directors.

COPPER SEMI MANUFACTURES, electrical machinery, pneumatic tyres, and industrial and medical gases are among the industrial products which are now the subject of investigation by the Monopolies Commission. The President of the Board of Trade stated that the commission was also investigating the general effect on the public interest of certain widely prevalent discriminatory practices.

SIR LEONARD ROPNER, who asked the Minister of Supply the amount of pig-iron imported from the U.S.S.R. in 1953 and what was the quantity of pig-iron which would be imported under existing contracts in 1954, was told by Mr. A. R. W. Low, Parliamentary Secretary, that no pig-iron was imported from the U.S.S.R. in 1953. Pig-iron could be imported freely under open general licence and he was therefore not in a position to give the forecast asked for.

New E.C.S.C. Price Rules

From February 1, when the European Coal and Steel Community's new price rules came into operation, producers in France, Belgium, Luxembourg, and the Netherlands have published new lower prices for some products. This is the first major change in the published prices since the opening of the common market. Reductions average about 5 per cent. of the May price, but some are as much as 8 per cent. In Germany only wire-rod prices have been reduced.

In France, opposition to the new regulations to make the pricing system more flexible, has hardened. M. Louvel, the Minister for Industry, has announced that the French Government is to bring an action before the Court of Justice against the High Authority for issuing rules, which the French consider contrary to the treaty. Under the provisions contained in the treaty for the working of the Court, this action is liable to take about six months. Meanwhile, the High Authority has been requested by the French Government to modify the new decisions and bring them more into line with the spirit of the treaty.

Discussion Meetings

The Consultative Committee and the Council of Ministers are to discuss the working of the new rules at their next meetings, and another meeting of the 40 users and merchants, who have recently examined this question with the High Authority, is to be called when enough time has elapsed for a considered view to be given.

The sub-committee appointed by the Consultative Committee, to examine the question of giving rebates to consumers of steel who manufacture for export, has started work. The French representative has apparently made it clear that French producers are fully in favour of this, provided that a system can be worked out which avoids discrimination between these consumers, fixes limits to the rebates, and has adequate safeguards. They suggest that rebates should only be given when at least 20-25 per cent. of the finished article is steel, and that rebates should not be given to bring the price of steel to a transforming industry within the community to a figure lower than the price paid by his competitor in a third country.

In Germany, January crude steel production was 1,300,609 metric tons, against 1,236,135 metric tons in December. Because of the number of working days, however, daily production fell from 49,445 tons to 49,079 tons. Pig-iron production rose from 887,634 tons in December to 922,295 tons in January, but again the daily average was lower. The first of the three new German plate mills due to come into operation this year has just started production at Bochumer Verein with a monthly capacity of between 60,000 and 70,000 tons. There is some speculation that when the August Thyssen Hütte and Watenstedt mills begin production in the summer there will be too great a plate capacity for the demand.

PARSONS ENGINEERING COMPANY, LIMITED—The chairman, Major R. C. W. Neale, states that the order-book position is still satisfactory and, although during the year the volume of work undertaken by the company under agreement with Petters, Limited, was not at the level hoped for, there are now good signs that the volume of work that may be expected from this source may be at an increased level during this financial year. Trading profit, after manufacturing and administration expenses, for the year ended October 31, 1953, was £24.033, against £18,253 in the previous year.

Personal

MR. G. E. TAYLOR, MR. W. J. MILLAR and MR. A. C. GEDDES have resigned from the board of the Electric Furnace Company, Limited.

MR. ALEXANDER MCDONALD has been appointed secretary of the Institution of Civil Engineers. He is to succeed Mr. E. Graham Clark, who is retiring this year.

MR. FREDERICK WILLIAM BUGLASS, who has been appointed works director of Percival Aircraft, Limited, Luton, became works manager to the firm in May last year.

MR. K. M. JOHNSTONE, managing director of Babcock & Wilcox, Limited, of Africa, will retire in July from this position but remain a director. His successor will be Mr. J. S. Woosley, assistant managing director.

MR. PAUL RICARD, who for many years headed French industrial and research activities as president of the *Centre Technique*, has been advanced in the Order of Legion of Honour to the grade of Commander.

MR. F. H. REID, who was formerly principal of the South-East London Technical College, has been appointed education officer of the Institution of Mechanical Engineers, in succession to MR. J. W. BISPHAM.

MR. LESLIE M. REAY, M.B.E., has been appointed London sales manager for the electric-motor division of Newman Industries Limited. Mr. Reay has been with the Company for five years as a sales engineer in the London area.

MR. RONALD D. SMITH has been appointed president of the Canadian Conveyors, the associated company in Canada of Geo. W. King. MR. STEWART G. BENNETT and MR. KENNETH W. DALGLISH have been elected directors of the Canadian firm.

MR. J. BISHOP, joint general sales manager of the heavy castings division of Newton Chambers & Company, Limited, Thorncliffe, is leaving to take up an appointment as general manager of a firm of chemical engineers at Uxbridge.

MR. A. TREECE, who recently retired from the production-control office of Rolls-Royce, Limited, Derby, after 41 years' service, was presented with a piece of Crown Derby china when the office staff held their annual dinner at the Chaddesden Park Hotel, Derby.

REAR-ADMIRAL M. S. SLATTERY, chairman and managing director of Short Bros. & Harland, Limited, aeronautical engineers, of Belfast, will receive the honorary degree of Doctor of Science at the graduation ceremonies in July at Queen's University, Belfast.

DR. R. H. PURCELL, deputy chief scientific officer at the Admiralty, has been appointed to succeed SIR EDWARD PARIS, who is retiring from his position as chief scientific adviser to the Home Office. Dr. Purcell, who is 49, will take up his new duties on March 8.

MR. C. J. STOPFORD, managing director of British Titan Products Company, Limited, titanium pigment manufacturers, of Billingham (Co. Durham), has been released from his service with the company to enable him to join the National Lead Company, of America. He will take up his new appointment on July 1.

MR. A. A. PAGET, A.M.I.Prod.E., chief planning engineer with W. & T. Avery Limited, weighing-machine manufacturers, established in 1730, has been released to take up the appointment of works manager, in April, at the north London ironworks of Vandome & Hart, Limited, also weighing-machine manufacturers, but an even older concern, having been established in 1660.

MR. JAMES MITCHELL has retired from the offices of chairman and joint managing director of Mitchell, Russell & Company, Limited, Bonnybridge. He became the first managing director of the company when it was formed in 1929 to take over the business of Gillespies, Limited. In 1948 he was appointed chairman and joint managing director. Although retiring from active participation in the management of the business, he will continue to interest himself in its affairs, as he is continuing as a director. Starting his business career with Smith & Wellstood, Limited, he represented that company for many years in Australia and New Zealand. The directors of Smith & Wellstood and of Mitchell, Russell & Company entertained Mr. Mitchell to dinner last week on the occasion of his retirement.

Obituary

MR. BENJAMIN WILSON, a foreman erector with Fairbairn Lawson Combe Barbour, Limited, has died suddenly in Italy on his 49th birthday.

MR. JOHN WILLIAM STEVENS, co-founder of Express Lift Company, Limited, London, S.W.1, and London Metal Warehouses, Limited, died recently at the age of 67.

MR. ALBERT HOWARD LUNT, who was a founder and director of Lunt Bros., Limited, colliery agents and exporters, etc., of Birmingham, died on February 9. He was 74.

MR. CHARLES HARGREAVES, managing director of Hargreaves Hamilton & Company, Limited, textile-machinery accessory makers, engineers, etc., of Bolton (Lancs), died on February 13.

MR. R. W. HAMPTON, chief buyer at F. H. Lloyd and Company Limited, Wednesbury, died suddenly on February 12. He was 49. Mr. Hampton had been with the firm for the past 34 years.

MR. JOSEPH LEWIS, who retired from the post of joint general manager of the Marconi International Marine Communication Company, Limited, in 1948, died on February 9 at the age of 69.

THE DEATH is announced from Germany of HERR MAX LANGENHOHL of Gelsenkirchen, who represented his country at the very early meetings of the International Committee of Foundry Technical Associations.

MR. F. W. DOBBYN, who retired as secretary of Carmichael Bros., Limited, ironfounders, of South Shields, in 1952 after 40 years in that position, has died at the age of 70. He was still a director at the time of his death.

MR. ADAM LITTLE, of Hamilton, a founder-director of Blantyre Engineering Company, Limited, has died at the age of 80. He had been attending to business as usual until three weeks ago. Mr. Little became a director of the company in 1916.

MR. WILLIAM LORIMER, who retired six years ago from the chairmanship of the North British Locomotive Company, Limited, Glasgow, died on February 18, in Glasgow, at the age of 78. For almost 30 years he had been blind, but despite this handicap he had a complete mastery over the affairs of the company. The eldest son of the late Sir William Lorimer, first chairman of the N.B. Locomotive Company, he was educated at the Old Albany Academy, Glasgow, and Glasgow University. Mr. Lorimer became one of the original managing directors of the North British Company when it was formed in 1903. He succeeded to the chairmanship on the death of Sir Hugh Reid.

News in Brief

THE ADDRESS of Textile Machinery Makers, Limited, is now Hartford Works, Oldham.

THE BRITISH TYRE & RUBBER COMPANY, LIMITED, has appointed Mr. J. F. MacGillivray group personnel manager to the company and its subsidiaries.

MAJOR, ROBINSON & COMPANY, LIMITED, of Manchester, announce the appointment to their Board, as sales director, of MR. F. J. ROBINS, who is in charge of the firm's London Office.

PLANS for the new dry dock of Swan, Hunter & Wigham Richardson, Limited, which is capable of accommodating tankers up to 45,000 tons dw., have been approved by Wallsend-on-Tyne Town Council.

ASSOCIATED BRITISH ENGINEERING, LIMITED, have agreed to sell to Thomas Tilling, Limited, at the current market price its holding of 2,000,000 ordinary shares of the Brush Electrical Engineering Company, Limited.

JAMES NORTH & SONS, LIMITED, are exhibiting on stand Q.14 a comprehensive range of their P.V.C., fabric-supported, industrial gloves and clothing at the British Industries Fair, to be held this year from May 3 to 14.

A CONTRACT has been secured by H. O. Strong & Sons, Limited, Bristol, for a complete boxmaking plant for the Turkish Government. This long-term contract, worth £200,000, will be executed as sterling becomes available in Turkey.

THE FIRST AWARDS for good service under the company's new scheme were made last week by Newton Chambers & Company, Limited, when 29 men, and seven widows whose husbands had given long service, received a total of £3,000.

MATHER & PLATT, LIMITED, textile and hydraulic engineers, of Manchester, announce an increase of £129,816 in the net profit to £558,606 for the year ended December 31 last. The annual distribution of 15 per cent. is unchanged.

CONDUCTED PARTIES are to be admitted to the Birmingham Stock Exchange on Wednesdays to help those who "genuinely want to know" about its work, Mr. Ian C. Lea chairman of the Exchange, announced at the annual members' dinner.

ALL RECORDS in gas supply were broken in meeting the demand created by the recent cold weather. In one week the Gas Boards supplied 15,710 million cub. ft., beating the previous week's figure of 14,850 million cub. ft., which was itself a record.

YORKSHIRE FIRMS who are to exhibit at the forthcoming international agricultural machinery exhibition in Paris include David Brown's, of Huddersfield; John Fowler's, of Leeds; and the Harvest Saver & Implement Company, Limited, of Kirbymoorside.

OF THE 311 RECIPIENTS of gold watches presented to employees of the Chesterfield Tube Company, Limited, who have completed 25 years' service, 235 are still with the company. Recently 27 people received watches at the fourth annual presentation.

C. A. NEWTON AND COMPANY, LIMITED, electrical and general engineering contractors, are holding a demonstration of domestic appliances at their temporary showrooms at Sadler Gate, Derby. It started on February 15 and continues to February 27.

R. & W. HAWTHORN, LESLIE & COMPANY, LIMITED, announce an interim dividend 1 per cent. higher at 6 per cent. on account of the year to June 30, 1954, the Board states that the increase must not be regarded as an indication that the total for the year is to be increased.

THE LANCASHIRE BRANCH of the Institute of British Foundrymen is to visit the foundry of Ferranti, Limited, Hollinwood, during March. In order to give members a better opportunity of viewing the plant, there will be an "open house" for members of the branch every Wednesday in the month.

STEEL PRODUCTION in the United States in January was 7,960,000 tons of ingots and steel for castings, according to the American Iron and Steel Institute. This was slightly above the revised December figure of 7,946,328 tons, but almost 2,000,000 tons less than the 9,897,962 tons produced in January, 1953.

AT THE BRITISH INDUSTRIES FAIR at Castle Bromwich, Conveyancer Fork Trucks, Limited, will be exhibiting on stand D.717/616 of the Owen organization, of which it is a member. The principle exhibit will be a fork-lift truck model E2-20/3W. This 2,000-lb. battery electric three-wheel truck is a re-styled development of earlier models.

DURING THE YEAR ended December 31, 1953, there were 28,543 new registrations under the Registration of Business Names Act, 1916, bringing the total number on the Register to 653,531. Twelve prosecutions were instituted during the year for non-compliance with the provisions of the Act and a conviction was obtained in each case.

AN AGREEMENT has been signed between Sheepbridge Engineering, Limited, of Chesterfield, and the Horix Manufacturing Company of Pittsburgh, U.S.A., granting the British firm sole manufacturing and selling rights for the complete range of Horix automatic bottle-filling machines for practically the whole of the sterling areas of the world.

THE DIRECTORS of the Enfield Rolling Mills, Limited, propose a four-for-five scrip issue which, they state, must not be regarded as implying an increased dividend distribution for the year to December 31, 1953. They hope to be in a position to indicate dividend prospects for that year in a circular which they propose to send to ordinary stockholders to-morrow.

AT MELTHAM, on February 19, was held the annual "perfect attenders" dinner—the tenth function of its kind—by David Brown Tractors (Engineering), Limited, at which there were 121 honoured guests, all employees with good time-keeping records, 106 of them men and 15 women. Every year until this year, the number of workers qualifying for invitations has risen.

REPRESENTATIVES of the Merseyside Industrial Development Association will launch a campaign in the United States next month to interest American manufacturers in extending their operations to Britain. The aim is to encourage the establishment of factories on Merseyside or the granting of licences to British industrialists to manufacture American products.

A MECHANICAL CONTINUOUS LOADER which can automatically take sand-like materials from the heap and introduce them to hoppers or a conveyor system has been developed. It is known as the Rotor-Loader and is being handled in this country by David Roberts & Company (Engineers), Limited, 276, Monument Road, Birmingham, 16, from whom details can be obtained.

MR. TOM WILLIAMSON, C.B.E., J.P., general secretary of the National Union of General and Municipal Workers and joint chairman of the British Productivity Council, is addressing the Insitution of Works Managers

News in Brief

at 7 p.m. on Wednesday, March 10, at the Waldorf Hotel, London, W.C.2. To enable industrialists generally to be present, the meeting is to be an open one.

AFTER AN ADJOURNMENT of a few minutes, five judges sitting in the Scottish Court of Criminal Appeal in Edinburgh, on February 17, unanimously quashed the conviction for murder against 16-year-old John Chalmers, of Larbert. He was sentenced on November 12 to be detained during H.M. pleasure for the murder of Peter Hastings, of Falkirk, aged 51, at Torwood Foundry, Larbert.

IT IS ANNOUNCED that E. Gordon Whiteley, Limited, textile-machine makers, of Morley, have secured a £500,000 contract to supply Russia with textile finishing machinery, the deal being a sub-contract order and part of the £1¼m. contract announced on February 5 by Platts Brothers, of Oldham, covering five Yorkshire and Lancashire companies, which combined to submit tenders to Russia.

IN ANNOUNCING recent Board changes of T. W. Ward Limited, of Sheffield, one of the most important was inadvertently omitted—the appointment of Mr. Arnold Carr as assistant managing director of the company. For many years Mr. Carr has taken the greatest interest in the foundry industry and indeed is on the Board of one foundry concern, Widnes Foundry Company Limited.

THE OVERALL LEVEL of prices of basic materials used in British industry showed a further slight fall during January. The Board of Trade's index (June 30, 1949 = 100) declined by 0.4 per cent. to 141.1 per cent. There were further falls in the prices of copper (down 2.3 per cent.), tungsten ore (down 15.3 per cent.), and lead (down 4.2 per cent.). The price of aluminium ingots rose by 3.2 per cent.

THE OLD-ESTABLISHED FIRM of Richard Haighton Limited, Vulcan Ironworks, Nelson, is transferring to the Burnley premises formerly occupied by George Keighley (Looms) Limited. Now a subsidiary company of Pope & Pearson Limited, Leeds, the firm has occupied the Vulcan Ironworks since 1894, and are now producing household ranges, machine-tool castings and general engineering products.

BRADFORD CORPORATION has approved an order that in about a year's time will make 20 smokeless zones. Nineteen of them are residential—mainly council estates where the use of smokeless fuel is already a condition of tenancy—and the other is the centre of the city. The corporation has been assured by the Ministry of Fuel and Power that coke supplies will be large and regular enough to justify the council's action.

THE 33,000-TON WORLD HARMONY, which was launched on February 16 at the Walker-on-Tyne yard of Vickers-Armstrongs, Limited, is the largest tanker to be built in the United Kingdom. She is the eighth tanker to be built by the company for Mr. Stravos Niarchos, a Greek shipowner. Two even larger tankers are being built at the company's Barrow yard, which will complete a total order worth £13,000,000.

THE ANNUAL DINNER, on February 12, of the Wolverhampton Engineering Society marked the opening of the Society's jubilee year. A toast to the society was proposed by the Mayor of Bilston, Councillor J. V. Lavender, and Mr. J. M. Boyd, the president, responding, said that the society tried to provide a medium through which engineers of all branches of the industry could meet, make friendships, and discuss their problems.

AT A SYMPOSIUM on the non-ferrous metal industry in India organized under the auspices of the National Metallurgical Laboratory (Council of Scientific and Industrial Research) of India, Mr. F. C. Goldsmith, resident technical representative of Foundry Services (Overseas), Limited, read a paper, "The Chemical Treatment of Molten Non-ferrous Metals." The symposium, from February 1 to 3, was held at Jamshedpur and was attended by over 60 delegates.

THE SAXONIA, the first of three 22,000-ton Cunard passenger liners to be built for the Canadian service, was launched by Lady Churchill at the Clydebank yard of John Brown & Company, Limited, on February 17. John Brown & Company also has a contract for the Saxonia's two sister ships. Except for the Caronia, the Saxonia is the biggest Cunarder to be launched since the war. She will carry 925 passengers and will have 300,000 cub. ft. of cargo space.

BABCOCK & WILCOX, LIMITED, announce that the first interest payment on the £4,000,000 4½ per cent. debenture stock, 1980, will be made on March 31, 1954. On stock fully paid on allotment, the payment will be £2 0s. 4d. per cent., less tax. On all other stock, the payment will be £1 14s. 7d. per cent., less tax. These payments will be made to stockholders on the register on March 15. The transfer register will be closed from March 15 to 20.

THE SERVICE DIVISION of Petters, Limited, a member of the Brush group, is to provide each of its 47 service engineers with a fully equipped Austin A 40 service van. The vehicle, chosen after several years' experiment with a number of types, is fitted with a wide range of spares, which are laid out in special racks to facilitate selection and protected against damage, special tool-kits, and slide rails to enable spare engines to be carried or a vice to be fitted.

TWO FILMS dealing with iron-ore supplies have recently been produced by the British Iron and Steel Federation, one covering iron-ore mining developments in French West Africa at the Conakry mine, and the other featuring the building of the special ore carriers in British shipyards. The sound films are called "Birth of a Mine" and "Special Ships" respectively. Copies of these interesting films are available on loan from the B.I.S.F., Steel House, Tothill Street, London, S.W.1.

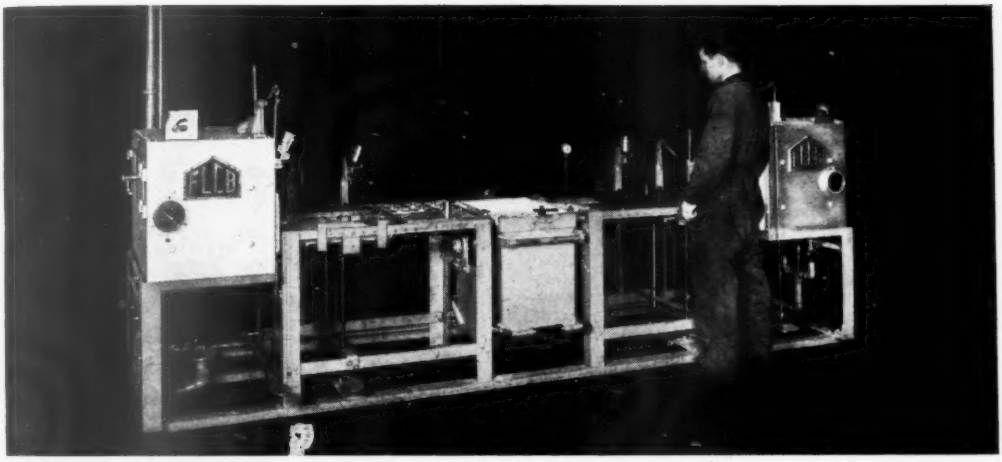
A WIDE RANGE OF MEDALS, including medals designed for the Institute of Fuel and the Institution of Civil Engineers, is illustrated in a catalogue, "Medallic Craftsmanship," issued by John Pinches (Medallists), Limited, 21, Albert Embankment, London, S.E.11. This firm brings 120 years of experience to the design of medals for societies, institutions, companies, and associations, and specializes in addition in the design and manufacture of badges for exhibitions and conferences.

METALLURGICAL STUDENTS should go into industry instead of remaining at a university for post-graduate courses, said Sir Arthur Smout, a director of Imperial Chemical Industries and president of Birmingham University Metallurgical Society, when he addressed the Society on February 18. "I do object to these men staying on and doing stupid exercises," he said. "It is often easier to discover than to apply," he added. "We want more men in industry who will apply the existing knowledge."

(*Continued on page* 226)

At Last!

Simple, Efficient & Low cost SHELL MOULDING with the Shelmolda



● **The Shelmolda Senior costs less than £700.**

STUDY THESE POINTS

- Size of plate 24″ x 16″.
- No complicated controls.
- Moulding always under the operator's control.
- Absolute simplicity—nothing to go wrong.
- Proved by working in a foundry continuously for months.
- Delivery 8—10 weeks.

● **The Shelmolda Junior costs less than £400.**

The Shelmolda brings this modern process within the reach of the smallest foundry. The standard machine illustrated here produces shells 23″ x 15″ but other sizes can be built to requirements. We shall be pleased to arrange for you to see the Shelmolda working in our foundry.

"Shelmolda"—Originated and manufactured solely by

FAIRBAIRN LAWSON COMBE BARBOUR LTD

LEEDS ENGLAND

236/53

News in Brief

(*Continued from page* 224)

LAST WEEK the full five-day working week was restored at the Chesterfield works of Sheepbridge Stokes, Limited, as a direct result of an increase in orders and discussion between the workers' representative and the management on the issue of worker productivity. The basis of agreement is that the workers' representative has promised maximum worker output with highest possible bonus earnings and the management has guaranteed full employment if maximum worker productivity is sustained.

THE EGYPTIAN NATIONAL PRODUCTION COUNCIL has accepted the offer of the German firm of Demag for the installation of an iron and steel mill. The German concern is to undertake the erection and working of the complete plant and will have full technical responsibility, including training of Egyptian personnel. The plant will eventually produce annually 10,000 tons of rails, 75,000 tons of sleepers and structural sections, 5,000 tons of heavy steel plates, 35,000 tons of medium plates, 15,000 tons of steel sheets, and 80,000 tons of billets.

EXHIBITS of Tubewrights, Limited (a subsidiary of Stewarts and Lloyds) at the Factory Equipment Exhibition to be held in the Royal Horticultural Society's New Hall, Westminster, March 22 to 26, include a welded tubular steel post pallet and also the "Pallage," which permits the rapid building-up of various forms of mechanical-handling equipment (tray, crate, rack, pallet, stillage) from standard components. The firm will also be exhibiting similar plant at the Mechanical Handling Exhibition to be held at Olympia, London, from June 9 to 19.

MAJOR R. C. W. NEALE, chairman of Parsons Engineering Company, Limited, states that the order-book position is still satisfactory and, although during the year the volume of work undertaken by the company under agreement with Petters, Limited, was not at the level hoped for, there are now good signs that the volume of work that may be expected from this source may be at an increased level during this financial year. Trading profit, after manufacturing and administration expenses, for the year ended October 31, 1953, was £24,033, against £18,253 in the previous year.

THE GROWING IMPORTANCE of the fuel question to the steel industry was emphasized by Prof. M. W. Thring, Professor of Fuel Technology at Sheffield University, at a meeting of the Society of Engineers and Metallurgists in Sheffield on February 18. The industry planned to expand steel production to 20,000,000 tons a year, and the electricity industry planned to burn an extra 20,000,000 tons of coal a year, he pointed out. However, the National Coal Board was unlikely to produce the amount of coal needed and either by price or rationing the problem of fuel would become ever more difficult.

MR. E. J. LAMBERT, managing director of the Dudley Foundry Company, Limited, Brierley Hill, opened a new sports and social club headquarters at the foundry recently, by "pulling" the first pint of beer, which he handed to the chairman of the club, Mr. H. Allen. The premises have been transformed from an old storeroom by the workpeople themselves, the firm providing financial assistance. On opening night Mr. Allen welcomed the president and thanked the management for all they had done. The workpeople had made an excellent job of the club, he said, and no one could grumble at the final result.

A FINAL DIVIDEND of 6¾ per cent., or 1s. 4d. per £1 stock unit, for the year to December 26, 1953, is recommended on the £10,616,193 ordinary capital of the English Electric Company, Limited. The proposed payment will absorb £389,260, compared with the £278,675 taken by the 10 per cent. final a year ago on the £5,308,097 existing prior to the "rights" and free scrip issues. Interims of 5 per cent. were paid in both years on the smaller capital. Group profits, after all charges other than taxation, rose by £420,886 to £4,779,920, and the net balance by £104,379 to £1,553,897, after a higher taxation provision.

MR. LESLIE J. CLARKE, the new president of the Coventry Chamber of Commerce, appealed for the end of what he called the "intellectual smog" which imputed that British industry was backward in its techniques, had a preference for old-fashioned machines and processes, and that British workers were not as energetic or proficient as those of other countries. Coventry was constantly evolving new techniques and apparatus. It seemed a bad policy to suggest to young people that their quality was doubted. A good deal of first-class material was coming along and the outlook for the future, despite all the difficulties, was bright.

DISAPPOINTMENT AND CONCERN was expressed at the monthly meeting of the Northern Regional Board for Industry at the fact that of the many recommendations made by the board last year on road improvements in the region not one had been mentioned by the Minister of Transport in his statement on the road improvement scheme. One of the black spots considered to merit a priority grading was the bridge and approach to Smith's Dock Company, Limited, Middlesbrough. It was stated that heavy loads such as boilers could not get into the yard because of the weakness of the bridge, with the result that the firm had to move ships to other parts of the Tees so that boilers could be installed.

HOLDERS of the £3,900,000 ordinary stock of Metal Industries, Limited, are to receive an interim dividend of 3 per cent. in respect of the year ending March 31 next—a reduction of 1 per cent. compared with a year ago. The directors inform stockholders that profits in the current year show a substantial reduction. Losses have been sustained by the mechanical engineering division, and earnings of certain other subsidiary companies are below last year and they do not foresee any immediate improvement. They add that the expect their recommendation in regard to a final dividend will be at a lower rate than the 8 per cent. paid last year, which made a 12 per cent. annual total.

FIFTY-FOUR YEARS' unbroken service in the House of Commons is an unusual if not a unique record, and one that certainly entitles its holder to a short rest for recuperation. That is why the Salter personal weighing machine which was presented to the Members' cloakroom by the Member of Parliament for West Bromwich in 1899 has recently returned to the maker's works for overhaul and a "deputy" from the same factory is doing temporary duty in the House. The donor of the machine was Sir Ernest Spencer, who represented West Bromwich from 1886 to 1906, when he retired, having survived four elections and achieved the longest term of service of any M.P. for the Division to date. The makers of the machine, Geo. Salter & Company Limited, are confident that when the veteran returns to duty it will give at least another 50 years' faithful service before "applying for the Chiltern Hundreds."

R.C.849 is a castable refractory that can be poured behind shuttering or placed in moulds in exactly the same way as ordinary concrete.
It is ready for service twenty-four hours after pouring. Setting, drying and firing shrinkage is practically nil. It has a high cold strength; which is increased by firing at 1350°C. It does not spall even under wide and rapid variations in temperature.

Physical Properties	
Maximum service temperature	1350°C
Density: Green	130 lb/cu. ft.
After firing at 1350°C	120 lb./cu. ft.
Cold crushing strength: Green	3360 lb/sq. in.
After firing at 1350°C	4480 lb/sq. in.
Refractoriness	Cone 19 (1520°C)
After-contraction ...	Not measurable after firing at 1350°C.

Other Morgan refractories include: M.R. PLASTIC MOULDABLE — a mouldable high-alumina refractory material for temperatures up to 1650°C (3002°F); M.I.22 INSULATING CONCRETE. The M.I.28 LOW-STORAGE INSULATING REFRACTORY for temperatures up to 2800°F (1538°C) and the M.R.I.— SUPER-DUTY REFRACTORY which is stable up to 1600°C (2912°F).
Literature will be sent on request.

MORGAN refractories

ARE WORTH FAR MORE THAN THEY COST

THE MORGAN CRUCIBLE COMPANY LTD
(Refractories Group), Neston, Wirral, Cheshire. Telephone: Neston 1406
M.R.33

THE TIN
that never was

At Ebbw Vale and at Trostre the new continuous mills roll out their strip; strip for the tins that never were tin, but steel.

Over twenty million boxes of tinplate were produced in 1953. A million tons of tin!

In this, and in every branch of the steel industry, production is surging forward, and the sights set on new targets. Thanks to the efforts of managements and workers alike, for eighteen months continuously, record steel output has been achieved. Britain is getting the steel she needs.

STEEL is doing a good job

THE BRITISH IRON AND STEEL FEDERATION T.67

Raw Material Markets

Iron and Steel

Pig-iron output in January was 229,600 tons, and although this was a record, giving an annual rate of 11,941,000 tons, no difficulty is experienced by producers in disposing of their outputs; in fact, it is still necessary to supplement supplies with imported iron for both steelworks and foundries use.

Production of steel maintains its upward trend, due mainly to the additional supply of basic steelmaking pig-iron from the larger and greater number of furnaces now in blast. The melting furnaces continue to use a bigger percentage of pig-iron than usual in their mixtures, although scrap supplies are now on a better scale than they have been for some time.

The record outputs of pig-iron have added little extra tonnage for the use of the foundries. It may be that the engineering and speciality foundries will benefit to some extent from the increased outputs of hematite pig-iron, but the pig-irons of their choice, the low- and medium-phosphorus grades, are in very stringent supply and current deliveries result in hand-to-mouth working. It is reported that a Scottish producer of this grade has now gone over entirely to the supply of pig-iron for the steelworks, and this will still further reduce available tonnages, as many English foundries have been helped by supplies from that source, although the extra carriage charges involved a higher price.

The light and jobbing foundries are better employed, but more work is needed to keep all plants fully operative, particularly in the Midlands, where these foundries show varying degrees of activity. The demand for high-phosphorus pig-iron is at a higher level, and outputs of this grade are practically absorbed by the demand.

A possible increase in the price of pig-iron owing to the addition of 10 per cent. to freight charges and higher cost of coke will cause concern among the foundries, as they consider that this will retard their efforts in securing business, particularly when the need is for keeping production costs down in order to quote competitively, chiefly for oversea trade.

Non-ferrous Metals

In spite of a weaker tendency in American non-ferrous metals, coupled with rather depressing figures of copper consumption in January, last week saw prices on the London Metal Exchange somewhat firmer, or at the worst only slightly lower on balance, at the close of trading on Friday. After holding out against the downward trend in London, lead and zinc both gave way, the former coming down by ½ cent to 12½ cents, while the latter lost ¼ cent to 9¼ cents. Not unnaturally these losses were not without some effect in Whittington Avenue, but, thanks to a sharp recovery during the unofficial session on Friday afternoon, there was not much change on balance. Zinc lost 5s. for February, while May closed without change; lead was marked down by 5s. for both positions. In tin, there was a noteworthy widening of the backwardation to £28, for the close was £665 cash and £637 three months. On balance cash gained £7 10s. and three months only £2. Copper at one time reached £236 for cash, but closed below the best at £234 on Friday afternoon, but, even so, 30s. above the previous Friday. Three months stood at £216 10s., which showed a gain of 15s. The backwardation, which at one time stood at £20, was £17 10s. at the close of business. The turnover was fully up to average.

Details of world copper statistics have been issued by the Copper Institute in New York. United States production of crude copper was 84,300 short tons in January—4,000 tons down on December—while output of refined, at 111,600 tons, compared with 123,300 tons in December. Deliveries of refined copper suffered a severe setback to 77,100 tons, compared with 112,200 tons in December, the January figure being the lowest seen for about five years. It would be unwise to presume that this figure sets the pattern for this year, and we must expect that February will show an improvement. Stocks of refined copper at January 31 stood at 108,121 tons, compared with 89,193 tons at December 31. Outside the United States production of crude copper was 114,100 tons, which was 5,400 tons down on December, while output of refined, at 85,400 tons, compared with 98,500 tons in December. For these two reductions some amend was made by the figure of deliveries of refined copper, which, at 92,300 tons, were up by 5,300 tons. Stocks of refined copper were virtually unchanged at 280,510 tons.

Official metal prices were as follow:—

COPPER, Standard—*Cash:* February 18, £235 to £236; February 19, £233 to £233 10s.; February 22, £235 to £236; February 23, £235 10s. to £236; February 24, £235 to £235 10s.

Three Months: February 18, £217 10s. to £218; February 19, £216 5s. to £216 15s.; February 22, £217 to £217 10s.; February 23, £218 10s. to £218 15s.; February 24, £219 15s. to £220.

TIN, Standard—*Cash:* February 18, £670 to £672 10s.; February 19, £661 to £664; February 22, £667 10s. to £670; February 23, £667 10s. to £669; February 24, £667 10s. to £670.

Three Months: February 18, £643 to £645; February 19, £634 to £635; February 22, £638 to £640; February 23, £639 to £641; February 24, £644 to £645.

ZINC—*February:* February 18, £71 10s. to £71 15s.; February 19, £70 15s. to £71; February 22, £72 to £72 5s.; February 23, £72 to £72 5s.; February 24, £72 10s. to £72 15s.

May: February 18, £70 5s. to £70 10s.; February 19, £69 5s. to £69 10s.; February 22, £70 5s. to £70 10s.; February 23, £70 7s. 6d. to £70 12s. 6d.; February 24, £71 to £71 5s.

LEAD—*February:* February 18, £82 to £82 5s.; February 19, £80 15s. to £81; February 22, £82 to £82 10s.; February 23, £82 5s. to £82 10s.; February 24, £83 5s. to £83 10s.

May: February 18, £81 5s. to £81 15s.; February 19, £80 5s. to £80 10s.; February 22, £81 5s. to £81 10s.; February 23, £81 5s. to £81 10s.; February 24, £82 5s. to £82 10s.

Tungsten Ore Prices Reduced

The Ministry of Materials has reduced its selling price for tungsten ores of standard 65 per cent. grade and ordinary quality as follows:—Wolframite, from 145s. to 120s.; scheelite, from 140s. to 115s., per long ton, delivered consumers' works.

The new prices came into effect on Monday.

Foundry Coke Merchants' Association: Dinner

The fifth annual dinner of this Association was held last Thursday at the May Fair Hotel, London, W.1. Mr. R. J. McDonald—the chairman of the Association—presided. Amongst those present were Mr. R. H. E. Thomas, O.B.E., Mr. Arnold Carr, Mr. Barrington Hooper, C.B.E., Mr. C. F. Sullivan, Mr. Walter Armstrong, Mr. D. O. Sillars, and Mr. F. Harley. The function was organized by Mr. F. Arnold Wilson.